Appendix A
Traffic Crash Data Analysis

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Department of Transportation and
Public Facilities

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SECTION 1 INTRODUCTION

1.1 Overview

This report analyzes Alaska Department of Transportation & Facilities (DOT&PF) crash data for milepost (MP) 45 to 60 of the Sterling Highway (Study Area). A map of the Study Area is provided in Appendix A. This report provides technical support for the Sterling Highway Milepost 45 to 60 Supplemental Environmental Impact Statement (SEIS) that is currently being prepared by the DOT&PF.

1.2 Crash Analysis Data and Methodology

Crash analysis was performed through evaluation of historical crash data (2000–2009) for MP 45 to 60 of the Sterling Highway, and comparing the Study Area crash evaluation to the State as a whole. A qualitative analysis is also provided relative to other stretches of the Sterling Highway. These data were used to assess the relative crash rate, identify locations with the highest concentration of crashes, ascertain which crash types are most common, and determine the major factors causing crashes within the Study Area (Sterling Highway MP 45 to 60).

Crash data for the Study Area, the entire Sterling Highway, and statewide was obtained from DOT&PF for the most recently available 10 year period (January 2000 through December 2009). The crash data included crash location and severity, in addition to other crash characteristics such as the cause of the crash and roadway conditions. Average daily traffic within the Sterling Highway Study Area was taken from the DOT&PF Central Region Annual Traffic Volume Report for 2000 to 2009, which represents an average of four locations within the Study Area, and moose-vehicle collision data were provided by the DOT&PF.

SECTION 2 STUDY AREA CRASH DATA

This section of the report provides the crash data, including crash rate, seasonal crash rate, and crash injury severity, for the Study Area (Sterling Highway MP 45 to 60).

2.1 Crash Rate Description

The crash rate of a roadway segment is determined by calculating how many crashes exist per million vehicles per mile within the corridor (CPMVM). To calculate the CPMVM, the following information was used: the number of vehicles that use the highway on an average day, the length of the corridor, the number of days during the study period, and the number of crashes that have occurred during the study period. The formula for computing the crash rate on a roadway segment is as follows:

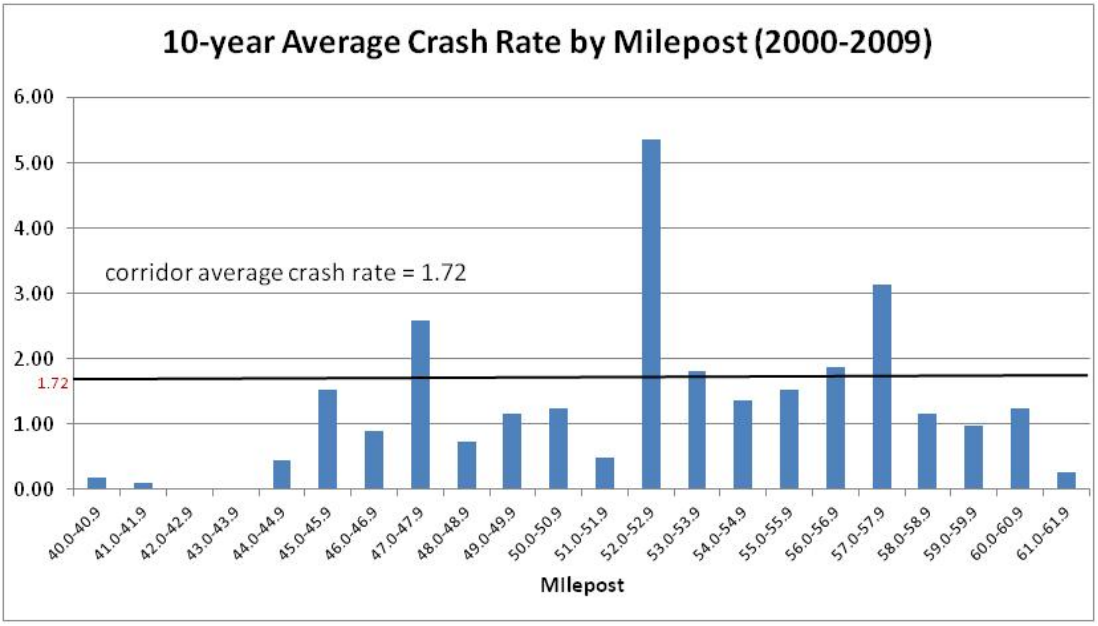
$$\frac{\text{(Total Crashes Within the Study Period) x (1,000,000 Vehicle Miles)}}{\text{(Number of Days in Study Period) x (Distance of Corridor in Miles) x (Average Daily Traffic)}}$$

The CPMVM was calculated using crash data from January 1, 2000 to December 31, 2009. To determine the CPMVM, the number of crashes during the study period was multiplied by one million vehicle miles and then divided by the: number of days in the study period, the distance of the corridor, and the average daily traffic.

2.2 Study Area Crash Rate

Within the 15-mile Study Area, 303 crashes occurred between January 1, 2000 and December 31, 2009. The average daily traffic (ADT) on the Sterling Highway during that period was 3,220 vehicles per day.[1] Based on this information, the average crash rate for the corridor was determined to be 1.72 CPMVM. For comparison, the statewide average crash rate for rural primary highways is 1.80. Figure 1 illustrates the 10-year Average Crash Rate by Milepost. Note that the crash rates shown by milepost may not be indicative of where problem areas actually exist within the Study Area.

Figure 1. Study Area Crash Rate per Milepost from January 2000 to December 2009



2.3 Study Area Seasonal Crash Rate

Crash occurrences on a roadway can vary greatly depending on the season. Although the crash rate computed for the entire year is the measure that is primarily used in this report, it is important to note the crash rate for both the winter and summer seasons in order to understand and address the whole crash potential for the roadway.

For this traffic safety analysis, winter was considered to be the five-month period between November and March, while summer was considered to be the seven-month period between April and October. Between January 1, 2000 and December 31, 2009, there was a winter ADT of 1,635 vehicles and a summer ADT of 4,353 vehicles. The winter and summer crash totals for the Study Area over the 10-year period were 153 and 150 crashes, respectively (Table 1). Although there was less traffic between November and March, there tended to be more crashes during the winter months, when snow and ice were likely present and darkness more prevalent.

[1] The average daily traffic (ADT) used to compute the accident rate was taken from the Alaska DOT Central Region Annual Traffic Volume Report for 2000 to 2009. This figure represents the average ADT for four locations within the Study Area.

Table 1. Study Area Seasonal Crash Rate

Season	Crash Rate (CPMVM)
Winter (Nov. – Mar.)	4.13
Summer (Apr. – Oct.)	1.07

2.4 Study Area Crash Injury Severity (Year-round)

Table 2 (and Appendix B: Table 1) shows the general severity of crashes and the number of different injury types experienced across the Study Area between 2000 and 2009.

Table 2. Study Area Crash and Personal Injury Summary from January 2000 to December 2009

	Crashes				Crash Rate[a]	Statewide Average Rate[b]	Percent above/below the Statewide Average
	Fatal	Injury	Property Damage Only	Total			
Segment 1 (MP 44.5 - 46.59)	0	16	18	34	1.53	1.80	-17.6%
Segment 2 (MP 46.6 - 47.79)	1	4	19	24	1.38	1.80	-30.4%
Segment 3 (MP 47.8 - 49.39)	1	11	11	23	1.31	1.80	-37.4%
Segment 4 (MP 49.40 - 51.29)	1	9	18	28	1.25	1.80	-44.0%
Segment 5 (MP 51.3 - 55.09)	1	34	75	110	2.46	1.80	+26.8%
Segment 6 (MP 55.1 – 58.2)	0	27	50	77	2.38	1.80	+24.7%
Total	**4**	**101**	**191**	**296**			

Notes:

[a] *The crash rate is the number of crashes per million vehicle miles.*

[b] *The Statewide average rate is for rural primary highways.*

Source: 2009 Alaska Traffic Crashes, June 2012, Alaska Department of Transportation and Public Facilities
http://www.dot.alaska.gov/stwdplng/transdata/pub/accidents/2009_AK_CrashData.pdf
From Figure 50, the "rural other principal arterial" statewide crash rate is 1.80.

Crashes where a fatality was involved require additional investigation to identify conditions that could be rectified to improve safety. There were five fatal crashes that occurred within the Study Area between 2000 and 2009. Appendix B: Table 3 describes each fatality in more detail. Of the five fatal crashes, four were head-on crashes and one was a fixed-object crash.

- **Causes of the Fatal Head-On Crashes:** Two of the head-on crashes were caused by the driver being under influence of alcohol, with one driving at an unsafe speed and the other driving on the wrong side of road. The third head-on crash was caused by a driver who fell asleep behind the wheel, and the fourth was caused by a driver speeding during snow conditions. Therefore, all of the four fatal, head-on crashes were the result of driver behavior.
- **Causes of the Fatal Fixed-Object Crash:** The other fatal crash in the Study Area was a fixed-object crash. This crash, also the result of the driver being under the influence of alcohol and driving at an unsafe speed. The vehicle, traveling above the speed limit, overturned, and crashed into the culvert on the roadway shoulder.

SECTION 3 ANALYSIS OF CRASH RATES, LOCATIONS, AND TYPES

This section presents an analysis of crash data for the Study Area. The purpose of Section 3 is to reveal trends, provide comparisons, and understand current crash data for MP 45 to 60.

3.1 Crash Rate by Milepost

There were three locations that had a much higher crash rate than the Study Area average. Table 3 provides the CPMVM from 2000 to 2009 for three milepost segments of the Study Area that had the highest concentration of crashes. Note that the crash rates for these mileposts may not be indicative of where problem areas actually exist within the Study Area. These three segments will be analyzed in further detail. See Appendix B: Table 1 for more information. A description of each milepost segment is provided below. For comparison, the CPMVM for MP 37- 45 is also provided in Table 3.

Table 3. Top Study Area and Adjacent Segment Crash Locations (2000-2009)

MP	Average Crash Rate (CPMVM)
47.0-47.9	2.58
52.0-52.9	5.35
57.0-57.9	3.13
Total (45-60)	**1.72**
MP 37-45	**1.15**

- MP 47.0 – 47.9 – This segment includes the Cooper Landing Visitor Cabin (MP 47.6), Bean Creek Road (47.7), and Snug Harbor Road (47.9), all of which include intersections and are more heavily populated sections of the highway.
- MP 52.0 – 52.9 – This segment is from Gwin's Lodge and MP 52.9. Gwin's Lodge is comprised of 14 cabins, a restaurant, and a tackle shop. The lodge is the closest accommodation to a world-class fishing spot, the confluence of the Kenai River and Russian River. Although the lodge is a popular destination for locals and tourists alike, it is only open May through September. Only 29 percent of the crashes on this segment between 2000 and 2009 were during the lodge's open season. This implies that root cause of the high frequency of crashes at this

location goes beyond just the high traffic volume associated with operation of the lodge and may be more related to roadway geometry. The curve at MP 52 was upgraded in 2007 and 2008. As 2009 is the last year of the data set, there is not enough data to determine the overall effectiveness the upgrades have on crash reductions.

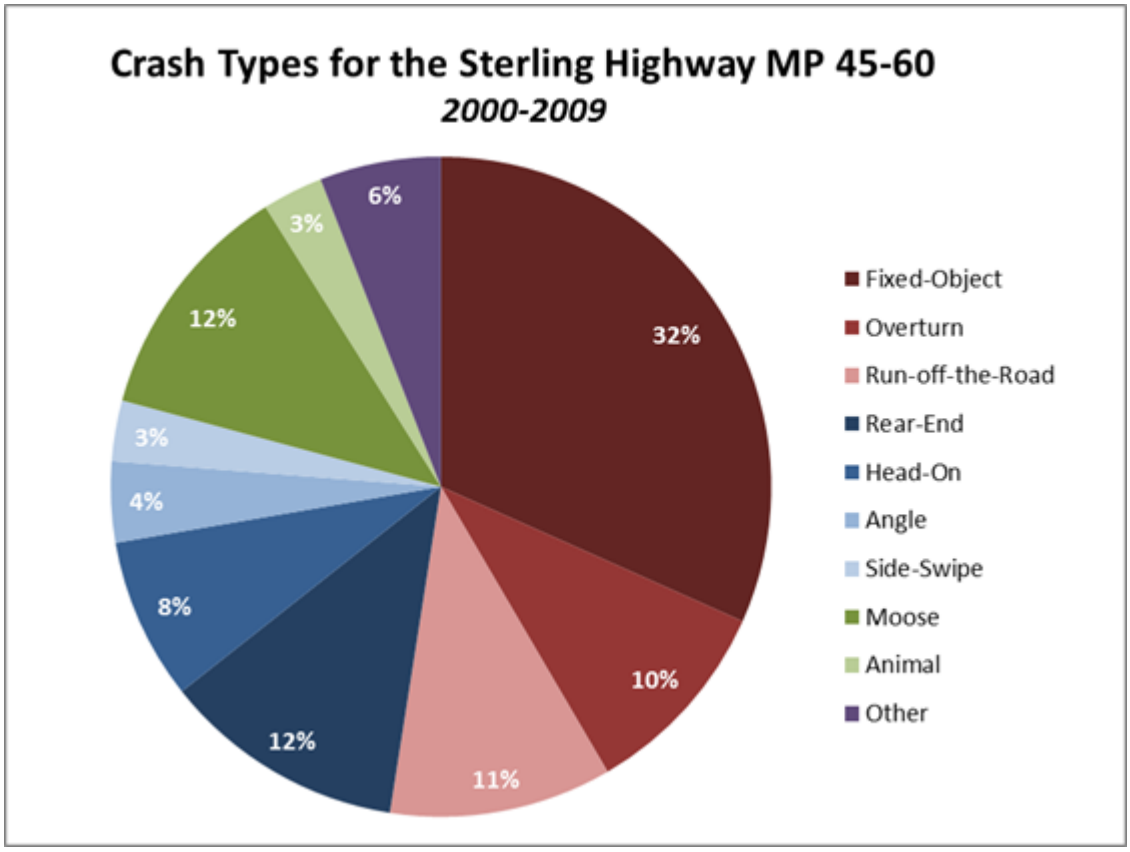
- MP 57 – 57.9 – This segment is from Fuller Lake Trail Head and MP 57.9. It is possible that the higher frequency of crashes at this location may be associated with more people wanting to stop, stay for extend periods of time, and park.

It is likely that the higher crash rates associated with these three Study Area segments are due in part to the fact that they are locations that draw more traffic, have more intersections, and promote stopping and prolonged stays. Further analysis of the crashes that occurred at these key locations is discussed in Section 3.4. It should be noted that this corridor received HSIP signing and delineation in 2007-2008. However, there has not been enough data collected after these improvements to provide any statistically relevant comparisons.

3.2 Study Area Crash Type

Between 2000 and 2009, there were a wide variety of crash types, such as: run-off-the-road and fixed-object (e.g. ditches, culverts, and embankments) crashes; head-on, rear-end, and angle collisions; and moose-related crashes (Appendix B: Table 2). Figure 2 illustrates the percentages of crash types within the Study Area during our analysis period. Further description of the common crash types is presented below.

Figure 2. Crash type within the project area between 2000 and 2009



3.2.1 Fixed-Object/ Overturn/Run-Off-The-Road Crashes

Summary: The majority of corridor crashes involved fixed-objects, vehicle overturns, and vehicles running off of the road. Such crashes comprised 53 percent of the total crashes between 2000 and 2009 (Figure 2). Ditches and culverts were two of the most common fixed-objects involved in crashes, with nearly 20 percent of the total crashes in 2009 involving ditches and culverts.

The large percentage of crashes caused by ditches and culverts reflects the greater trend of non-traffic-lane crashes, whether it is cars running off the road or crashing into ditches, culverts, embankments, or guardrails (Figure 3). Of the 303 crashes that occurred within the project area between 2000 and 2009, 31 occurred on a shoulder, 21 occurred on the roadside, and 39 occurred outside of the traffic-way, in total comprising 30 percent of the total crashes.

Cause: Fixed-object/overturn/run-off-the-road crashes commonly result from drivers losing control. This is often the result of: road conditions, excessive speed, close proximity of roadside barriers to moving traffic, or avoidance of other traffic. Often, such crashes are the result of driver behavior or impairment (i.e., fatigue, illness, or under influence of alcohol). The following roadway conditions can contribute to the occurrence of such crashes within the Study Area: roadway design, pavement condition, narrow roadway shoulders, and proximity of guardrail barriers to the roadway. Fixed-object/overturn/run-off-the-road crashes that occurred at high crash locations within the Study Area are evaluated in Section 5 to identify the most relevant roadway conditions.

3.2.2 Vehicle Rear-End, Head-On, and Angle Crashes

Summary: Vehicle rear-end, head-on, and angle crashes comprised 24 percent of the total crashes between 2000 and 2009. Only 15 percent of the total corridor crashes were congestion-related, and these were typically rear-end and sideswipe incidents. Within the Study Area, rear-end and sideswipe crashes represented 12 percent and three percent of the total crashes, respectively (AKDOT, MP 45-60, 2000-2009).

Head-on crashes comprised eight percent of the crashes in the Study Area between 2000 and 2009. While the percentage of head-on crashes is lower than other crash types, collision density maps from 2001-2008 (DOT&PF 2010) suggest that MP 45 to 58 is a high head-on crash location compared to other portions of the highway. Due to the fact that MP 45 to 58 maintained a rate of two or more head-on crashes per mile between 2001 and 2007, the State is concerned about the safety of this stretch of roadway. The AKDOT Central Region Traffic Department suggested that efforts be made to mitigate this crash type within the project corridor by using a variety of "Crash Modification Factors" (DOT&PF 2012). These efforts consist of installing 6-inch striping and narrower lanes in an effort to increase speed zone compliance.

Cause: Many of the vehicle rear-end, head-on, and angle crashes were the result of driver behavior or impairment (i.e., speeding, driver inattention, failure to yield, or improper lane change/passing). Of the 24 head-on crashes that occurred between 2000 and 2009, over 17 resulted from driver behavior or impairment. In addition, over eight of the 13 angles crashes that occurred in the Study Area were the result of driver behavior or impairment.

3.2.3 Moose-Related Crashes

Summary: There were 36 moose-related crashes in the Study Area between 2000 and 2009, representing 12 percent of the total crashes. Moose pose a safety concern within the project area, especially if traffic demand increases over time. Table 4 summarizes data procured from the Central Region Department of the DOT&PF's Moose-Vehicle Collision Rankings 2001-2005 (the latest data available). The purpose of showing this data is to reveal highway segments close to the Study Area that

have undergone mitigation as a result of their high frequency of moose-related collisions. Areas of roadway that are within the 95th percentile have may have undergone mitigation such as: off-site habitat/corridors, lighting, fencing, vegetation management, and at-grade warnings. Conversely, areas of roadway that are within the 75th percentile are may have undergone mitigation such as: improved brushing, vegetation management, signing, and winter trails (DOT&PF 2012). Mitigation for moose-related crashes is addressed on a case-by-case basis as funding allows.

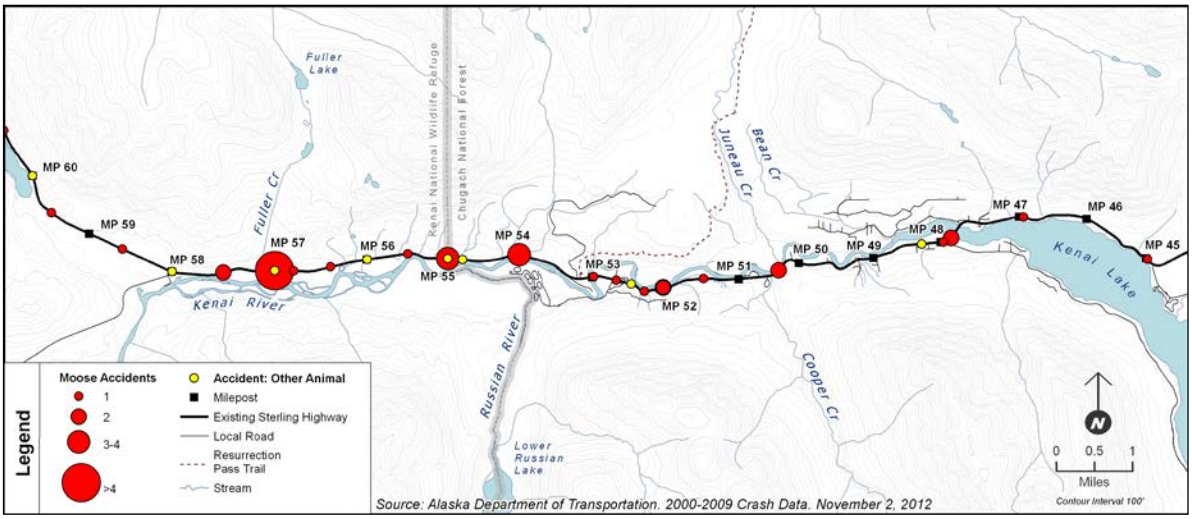
Table 4. Moose-Vehicle Collision Rankings 2001-2005 & Distance from the Study Area[2]

Roadway MP	Threshold Used and Rank	Recorded Collisions per Year	Average Collisions per Mile per Year	Distance from Project Area
Sterling Hwy MP 67.3-74.6	75th Percentile #27	5.2	0.7	~7.3 miles
Sterling Hwy MP 83-118.4	75th Percentile #2	47.2	1.4	~23 miles
Sterling Hwy MP 87.8-93.3	95th Percentile #1	18.6	3.5	~30 miles
Sterling Hwy MP 116.4-118.2	95th Percentile #15	2.4	1.5	~57 miles
Sterling Hwy MP 123.1-134.1	75th Percentile #21	6.6	0.6	~63 miles
Sterling Hwy MP 128-129	95th Percentile #19	1.0	1.0	~68 miles
Sterling Hwy MP 133-134	95th Percentile #18	1.4	1.4	~73 miles
Sterling Hwy MP 163.3-164.8	75th Percentile #29	1.8	1.2	~103.3 miles

A frequency of 8 crashes per mile per year places a stretch of roadway in the 75th percentile (under the threshold moose-vehicle collision values established in 1995, DOT&PF 12/5/03 Memo). Figure 4 shows the number of moose-related collisions between 2000 and 2009 that occurred within the Study Area (recorded to the nearest milepost). The mile segment with the highest number of crashes was MP 57 to 57.9, which experienced eight moose crashes between 2000 and 2009. The mile segment with the second highest number of crashes during that timeframe was MP 54 to 54.9, which experienced five crashes. While none of the one-mile segments within the Study Area currently fall within the 75th percentile, the correlation between the number of moose collisions and increases in traffic make it plausible that the threshold could be met in the future as traffic levels rise (Appendix C: Figure 2).

[2] The 75 percent and 95 percent thresholds are used to determine the level of mitigation suggested to reduce moose crashes. The numerical ranking of each stretch within the 75 percent and 95 percent threshold, respectively, is based upon crash density per mile and crash rate per million vehicle miles (CPMVM).

Figure 3. Map showing the location and number of crashes involving moose within the Study Area between 2000 and 2009



3.3 High Crash Locations

As presented in Section 3.3, the highest concentration of crashes occurred within segments MP 47.0 to 47.9, MP 52.0 to 52.9, and MP 57.0 to 57.9. Table 5 shows the number of each crash type that occurred at each high crash location.

Table 5. High Crash Locations Crash Type Summary from January 2000 to December 2009

MP	Total Crashes	Fixed-Object/ Overturn/Run-Off-The- Road	Rear-End	Head-On	Angle	Side-Swipe	Animal/Moose	Other
47.0-47.9	**32**	10	10	3	3	1	3	2
52.0-52.9	**65**	43	4	5	0	3	6	4
57.0-57.9	**35**	22	2	2	0	0	9	0

3.3.1 Analysis of MP 52.0 to 52.9

MP 52.0 to 52.9 includes the location of Gwin's Lodge (MP 52.0) and Gwin's Corner (approximately MP 52.3). MP 52.0 to 52.9 experienced 65 crashes over the 10-year time period. At Gwin's Corner, the roadway makes a relatively sharp horizontal curve, resulting in a design speed that is lower than the posted speed limit on the approaching roadways (45 miles per hour).At MP 52, wig wag beacons and large warning signs were added in 2007-2008. At least 43 of the 65 crashes that occurred along this one-mile stretch of roadway (66 percent) occurred on a horizontal curve. Forty-three of the 65 crashes also involved vehicles losing control, leaving the roadway, or crashing into ditches, culverts, embankments, or guardrails. Crashes between vehicles (which include rear-end, head-on, and side-swipe crashes) represented 19 percent of the total crashes. In addition, crashes between vehicles and animals, such as moose, represented another nine percent of the crashes that occurred between MP 52.0 and 52.9

3.3.2 Analysis of MP 57.0 to 57.9

MP 57.0 to 57.9, near the location of the Fuller Lake Trail Head, had the second highest crash rate. Thirty-five crashes occurred at this location between 2000 and 2009. At least 21 of the 35 crashes (60 percent) took place on a horizontal curve in the roadway. Twenty-seven of the 35 crashes (77 percent) occurred while snow or ice was present on the roadway or the pavement was wet. Twenty-two of the 35 crashes (63 percent) involved vehicles: losing control, leaving the roadway, or crashing into ditches, culverts, embankments, or guardrails. In addition, crashes that involved non-fixed objects, such as other vehicles or animals, represented another 26 percent of crashes within this section. There were two head-on crashes and two rear-end crashes that occurred over the 10-year period, representing 12 percent of the total number of crashes.

Along this stretch of the highway, the road has very narrow shoulders and a 6- to 8-inch drop-off from the edge of the pavement. Such a drop-off could cause a vehicle to roll when a driver is was taking corrective action or even pull a vehicle into the ditch once a tire is was off the pavement.

3.3.3 Analysis of MP 47.0 to 47.9

The segment between MP 47.0 and Snug Harbor Road (MP 47.0 to 47.9) includes the Cooper Landing Visitor Cabin (MP 47.6), the Bean Creek Road intersection (MP 47.7), and Snug Harbor Road intersection (MP 47.9). Thirty-two crashes occurred on this segment over the 10-year period. Five crashes occurred at the Cooper Landing Visitor Cabin (MP 47.6), seven crashes occurred at the Bean Creek Road intersection (MP 47.7), and seven crashes occurred at the Snug Harbor Road intersection (MP 47.9). In total, 10 of the 32 crashes (31 percent) were rear-end crashes that occurred while cars were queued to make a left turn onto side streets. Another 31 percent of the crashes were fixed-object/overturn/run-off-the-road crashes that involved vehicles losing control, leaving the roadway, or crashing into ditches, culverts, embankments, or guardrails.

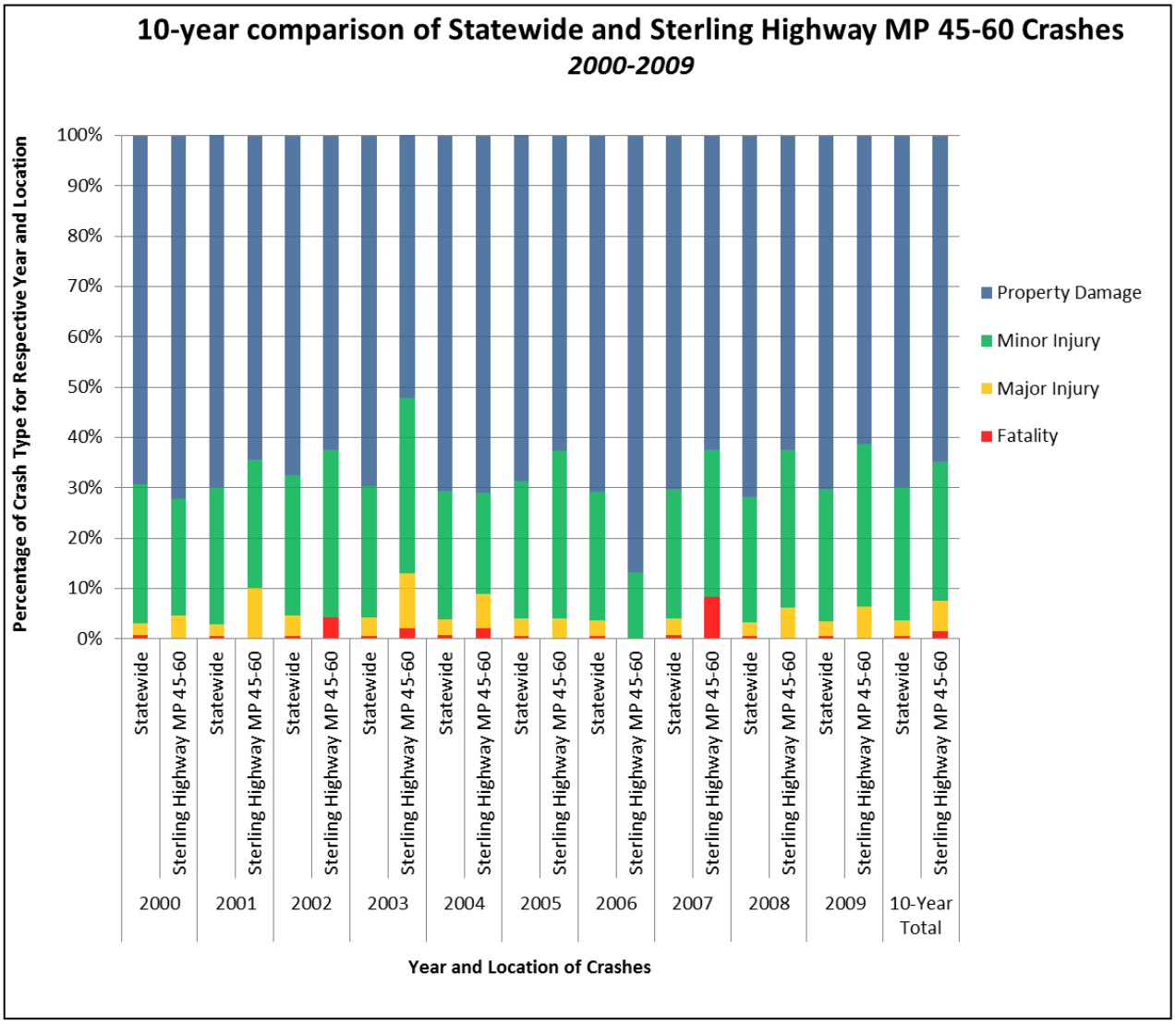
Four of the seven crashes located at the Bean Creek Road intersection (MP 47.7) were rear-end crashes that occurred while cars were queued to make a left turn onto Bean Creek Road. The two angle crashes that occurred were both the result of eastbound traffic trying to make a left turn onto Bean Creek Road. One of the angle crashes was caused by an eastbound, left-turn vehicle failing to yield to the through-traffic from the other direction. The other angle crash was the result of an eastbound, through-vehicle that improperly passed an eastbound-vehicle that was waiting to make a turn onto Bean Creek Road. The only head-on crash was caused by a driver speeding during snow conditions.

3.4 Comparison of Crash Severity within the Study Area, the Entire Sterling Highway, and Statewide[3]

Figure 4 shows that in addition to having more crashes per vehicle mile than the average state roadway, the crashes within the Study Area also tended to be slightly more severe, on average. Excluding the year 2006, MP 45 to 60 of the Sterling Highway had consistently fewer property damage and minor injury (non-incapacitating injury/possible injury) crashes and a higher proportion of major injury (incapacitating injury) and fatality crashes between 2000 and 2009. Also, during four of the ten years shown (2002, 2003, 2004, and 2007) the Study Area had a higher percentage of fatalities than the statewide average (Figure 4).

[3] It should be noted that the crash rate given for the entire state was based on crash data for all State-owned roadways, which includes a variety of road types.

Figure 4. Comparison of the proportional severity of crashes statewide and within the project area



3.5 Comparison of Unimproved and Improved Sections of the Sterling Highway

The Sterling Highway was originally constructed in the 1950s. Since then, few improvements have been made to update the road to meet current safety standards and to accommodate larger traffic volumes. The easternmost segment of the Sterling Highway (MP 37 to 45) was reconstructed approximately 12 years ago to improve the roadway geometry. Milepost segment 37 to 45 had similar roadway geometry to the existing conditions in the Study Area prior to the roadway improvements. As indicated in Section 3.1, the improved section of Sterling Highway MP 37 to 45 has a lower CPMVM (1.15) than the Study Area (1.72). While improved road conditions likely contribute to this difference, it is important to note that there are many other variables that also potentially play a role and that safety performance can vary according to the unique characteristics of each segment. For instance, MP 45 to 60 encompasses Cooper Landing and the higher number of driveways, side roads, and concentration of short trips that are associated with the community. While these conditions predispose the MP 45 to 60

segment to being less safe, updating the roadway to better accommodate such safety challenges has the potential to positively impact traffic safety within the Study Area.

SECTION 4 SUMMARY OF FINDINGS

MP 45 to 60 was found to have more crashes per vehicle mile than the average state roadway. Although the Study Area had fewer crashes per MVM than other sections of the Sterling Highway, its year-round crash rate (1.72 CPMVM) and frequency of injuries (1.5 injuries per mile) was found to be higher than MP 37-45, which is an improved section of the highway.

Between 2000 and 2009, there were a wide variety of crash types, such as: run-off-the-road and fixed-object (e.g. ditches, culverts, and embankments) crashes; head-on, rear-end, and angle collisions; and moose-related crashes. The majority of crashes within the Study Area were fixed-object/overturn/run-off-the-road crashes, accounting for 53 percent of the crashes. Rear-end, head-on, and angle crashes accounted for 12, eight, and four percent of the crashes respectively, while 12 percent of crashes were moose-related.

Between 2000 and 2009, there were five fatal crashes, 20 major injury crashes, and 85 minor injury crashes that occurred within the Study Area. These resulted in five fatalities, 22 major injuries, and 137 minor injuries. Of the five fatal crashes, four were head-on crashes and one was a fixed-object crash. All five of the fatal crashes were the result of driver behavior (e.g. fatigue, under influence of alcohol, or speeding), and therefore none of them was necessarily preventable from a roadway design standpoint.

The highest concentration of crashes occurred within the following sections: MP 52.0 to 52.9, MP 57.0 to 57.9, and MP 47.0 to 47.9.

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APPENDIX A

MAP 1 STUDY AREA

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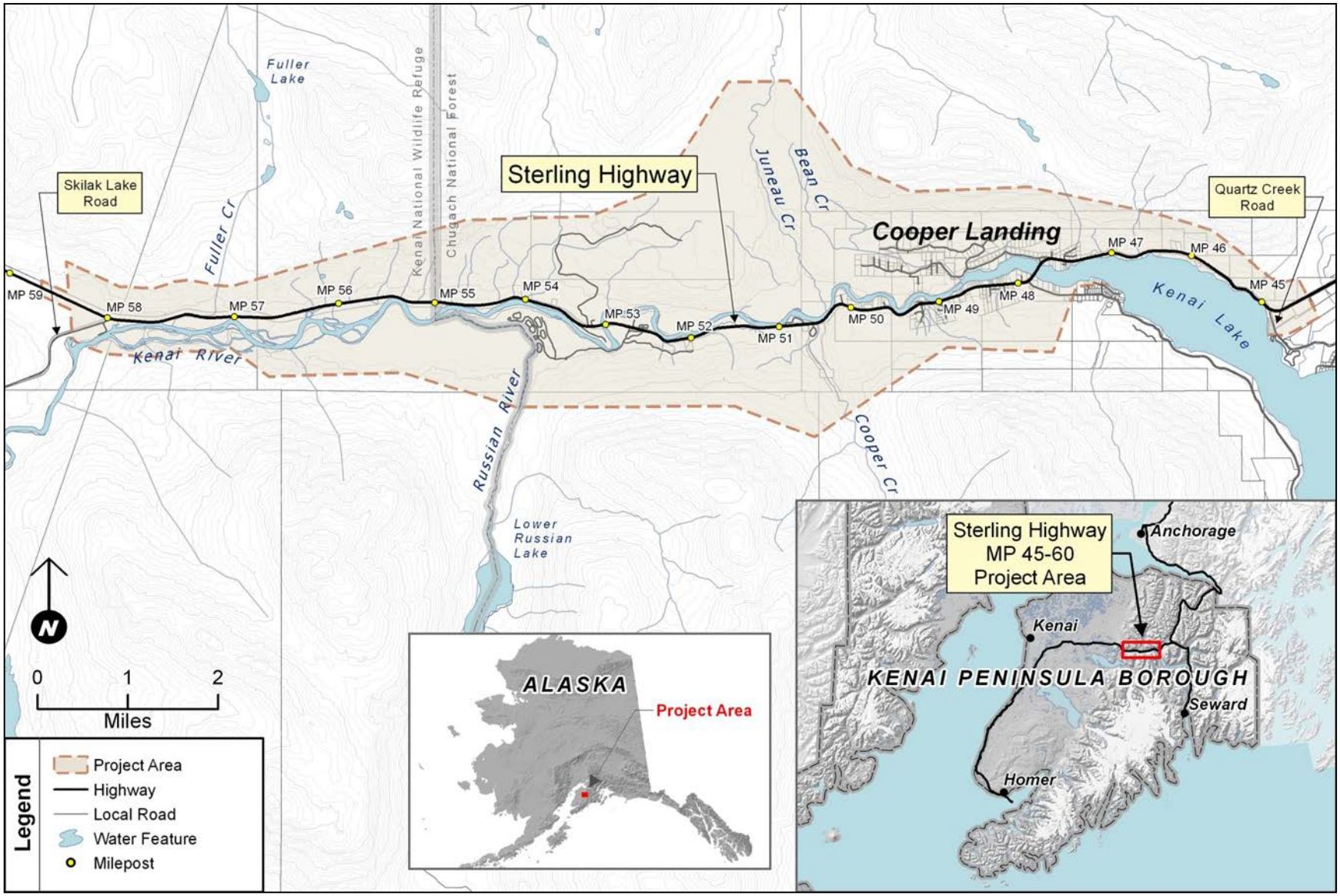

Map 1. Study Area and Alternatives

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APPENDIX B: TABLES

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Table 1. Sterling Highway Crash Summary per Milepost for the Past Ten Years

Crash Summary for Sterling Highway per Milepost from January 2000 to December 2009										
	Total	**Fatal**		**Major**		**Minor**		**PDO**	**2000-2009**	
MP	Crashes	*# of crashes*	*# of fatalities*	*# of crashes*	*# of injuries*	*# of crashes*	*# of injuries*	*# of crashes*	*Average AADT*	*Average Crash Rate*
40.0-40.9	**2**							2	3012	0.18
41.0-41.9	**1**							1	3012	0.09
42.0-42.9	**0**								3012	0.00
43.0-43.9	**0**								3012	0.00
44.0-44.9	**5**					1	1	4	3012	0.45
45.0-45.9	**19**			1	1	9	9	9	3403	1.53
46.0-46.9	**11**			1	1	4	6	6	3403	0.89
47.0-47.9	**32**	2	2	1	1	4	8	25	3403	2.58
48.0-48.9	**9**			2	2	4	6	3	3328	0.74
49.0-49.9	**14**			3	3	6	10	5	3328	1.15
50.0-50.9	**15**	1	1	1	1	1	1	12	3328	1.23
51.0-51.9	**6**					3	5	3	3328	0.49
52.0-52.9	**65**			1	1	18	27	46	3328	5.35
53.0-53.9	**20**	1	1	2	3	6	10	11	3027	1.81
54.0-54.9	**15**			2	2	2	4	11	3027	1.36

Crash Summary for Sterling Highway per Milepost from January 2000 to December 2009 (cont'd.)

	Total	**Fatal**		**Major**		**Minor**		**PDO**	**2000-2009**	
MP	Crashes	*# of crashes*	*# of fatalities*	*# of crashes*	*# of injuries*	*# of crashes*	*# of injuries*	*# of crashes*	*Average AADT*	*Average Crash Rate*
55.0-55.9	**17**			2	2	1	6	14	3062	1.52
56.0-56.9	**21**					6	9	15	3062	1.88
57.0-57.9	**35**			1	1	16	24	18	3062	3.13
58.0-58.9	**13**			2	3	2	5	9	3090	1.15
59.0-59.9	**11**	1	1	1	1	3	7	6	3090	0.98
60.0-60.9	**14**					2	3	12	3090	1.24
61.0-61.9	**3**					1	1	2	3090	0.27
MP45-MP60 Total	**303**	**5**	**5**	**20**	**22**	**85**	**137**	**193**	**3220**	**1.72**

Table 2. Sterling Highway Crash Type Summary per Milepost for the Past Ten Years

Crash Type Summary for Sterling Highway per Milepost from January 2000 to December 2009

MP	Total Crashes	Rear-Ends	Head On	Angles	Side-Swipe	Fixed Objects	Over Turn	Ran-off Road	Animal	Moose	Others
40.0-40.9	**2**			1						1	
41.0-41.9	**1**							1			
42.0-42.9	**0**										
43.0-43.9	**0**										
44.0-44.9	**5**					3	1				1
45.0-45.9	**19**				1	13	2	1		1	1
46.0-46.9	**11**	1	1	2	1	3	2				1
47.0-47.9	**32**	10	3	3	1	6	2	2		3	2
48.0-48.9	**9**	2	1	1		3			1	1	
49.0-49.9	**14**	3	1	1		6		3			
50.0-50.9	**15**	2	5		2	2		1		2	1
51.0-51.9	**6**			1		2		2		1	
52.0-52.9	**65**	4	5		3	22	10	11	2	4	4
53.0-53.9	**20**	3	3			5	2	4		1	2
54.0-54.9	**15**	2	1			3	1	2	1	5	
55.0-55.9	**17**	1		1		4	2	2	1	4	2
56.0-56.9	**21**	3		2		7	1	2	1	3	2

Crash Type Summary for Sterling Highway per Milepost from January 2000 to December 2009

MP	Total Crashes	Rear-Ends	Head On	Angles	Side-Swipe	Fixed Objects	Over Turn	Ran-off Road	Animal	Moose	Others
57.0-57.9	**35**	2	2			14	6	2	1	8	
58.0-58.9	**13**	2	1			4	1	1	1	2	1
59.0-59.9	**11**		1	2		4	1	1		1	1
60.0-60.9	**14**			1		7	2	1	1	1	1
61.0-61.9	**3**					2			1		
MP45-MP60 Total	**303**	**35**	**24**	**13**	**8**	**98**	**30**	**34**	**8**	**36**	**17**
Crash Type Percentage	**100%**	**12%**	**8%**	**4%**	**3%**	**32%**	**10%**	**11%**	**3%**	**12%**	**6%**

Table 3. Description of Fatal Crashes within the Study Area (2000-2009)

Fatal Crash #	Description
1	A head-on collision that took place at MP 47.7 on January 8, 2004 at the intersection of Sterling Highway and Bean Creek Road. It was on a roadway curve during daylight hours with snow on the pavement. This was caused by excessive driver speed during snow conditions. Vehicle 1 was moving too fast for conditions, lost traction, out of control and crashed head-on into vehicle 2, which was traveling in the opposite direction. This crash caused one fatality and one minor injury.
2	A fixed-object collision that took place at MP 47.9 on June 4, 2002 at the intersection of Sterling Highway and Snug Harbor Road. It was during twilight hours on the dry pavement. The police report stated the driver was under influence of alcohol and drove at an unsafe speed. The vehicle was moving too fast, overturned, out of control and crashed into the culvert on the roadway shoulder. This crash caused one fatality and one minor injury.
3	A head-on collision that took place at MP 50.5 on August 28, 2003. It was during daylight hours on the dry pavement. The driver in vehicle 1 fell asleep. Vehicle 1 was out of control and crashed head-on into vehicle 2, which was traveling in the opposite direction. This crash caused one fatality.
4	A head-on collision that took place at MP 53.5 on July 26, 2007. It was on a dark roadway curve without lightings on the dry pavement. The police report stated the driver was under influence of alcohol, drove on the wrong side of roadway, and crashed head-on into vehicle 2 which was traveling in the opposite direction. This crash caused one fatality and one major injury.
5	A head-on collision that took place at MP 59.5 on May 19, 2007. It was during daylight hours on dry pavement. The police report stated the driver was under influence of alcohol and drove at an unsafe speed. The vehicle was moving too fast, lost traction, out of control, and crashed head-on into vehicle 2 which was traveling in the opposite direction. This crash caused one fatality and one minor injury.

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APPENDIX C: FIGURES

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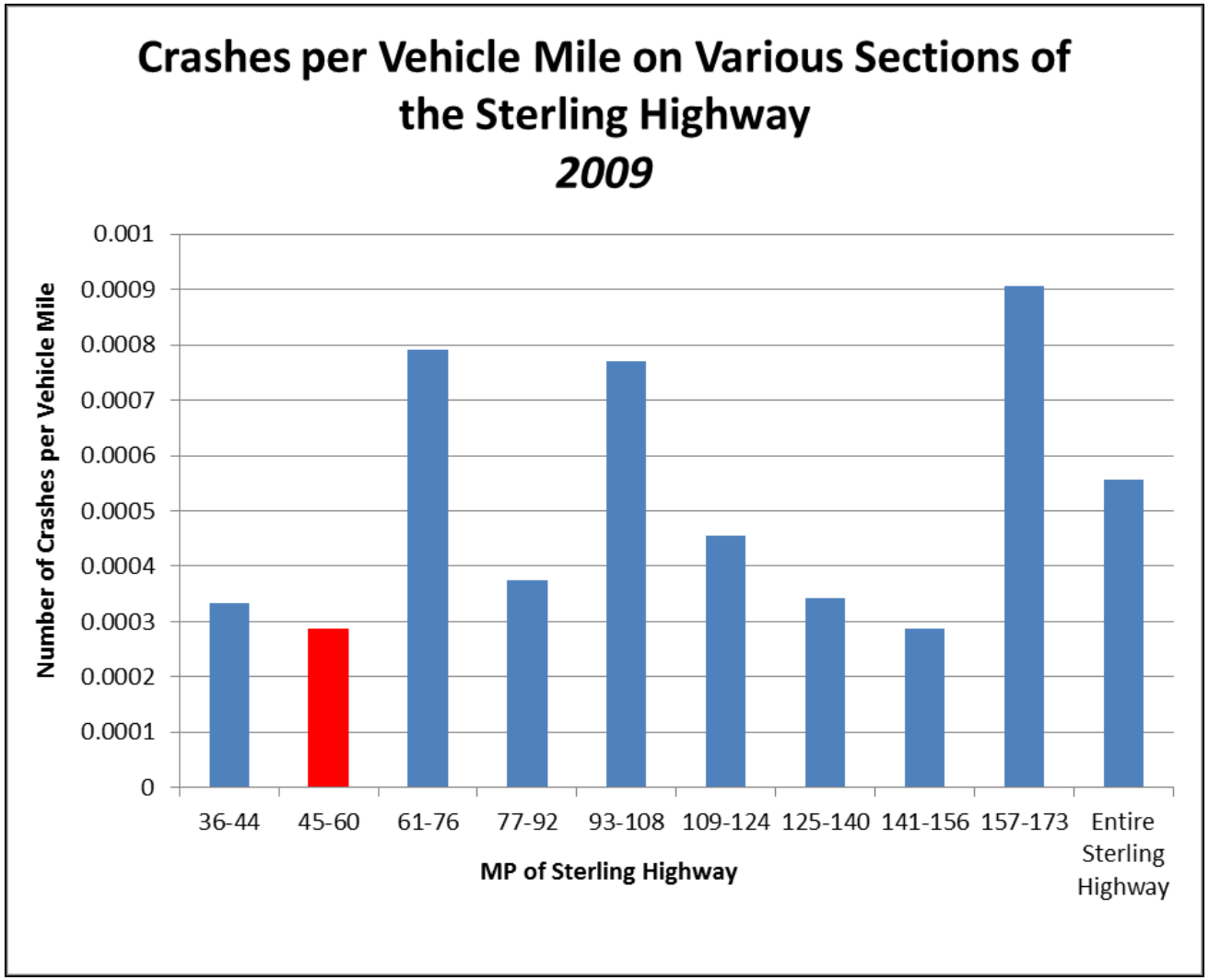

Figure 1. Graph comparing the number of crashes per vehicle mile experienced within different sections of the Sterling Highway in 2009

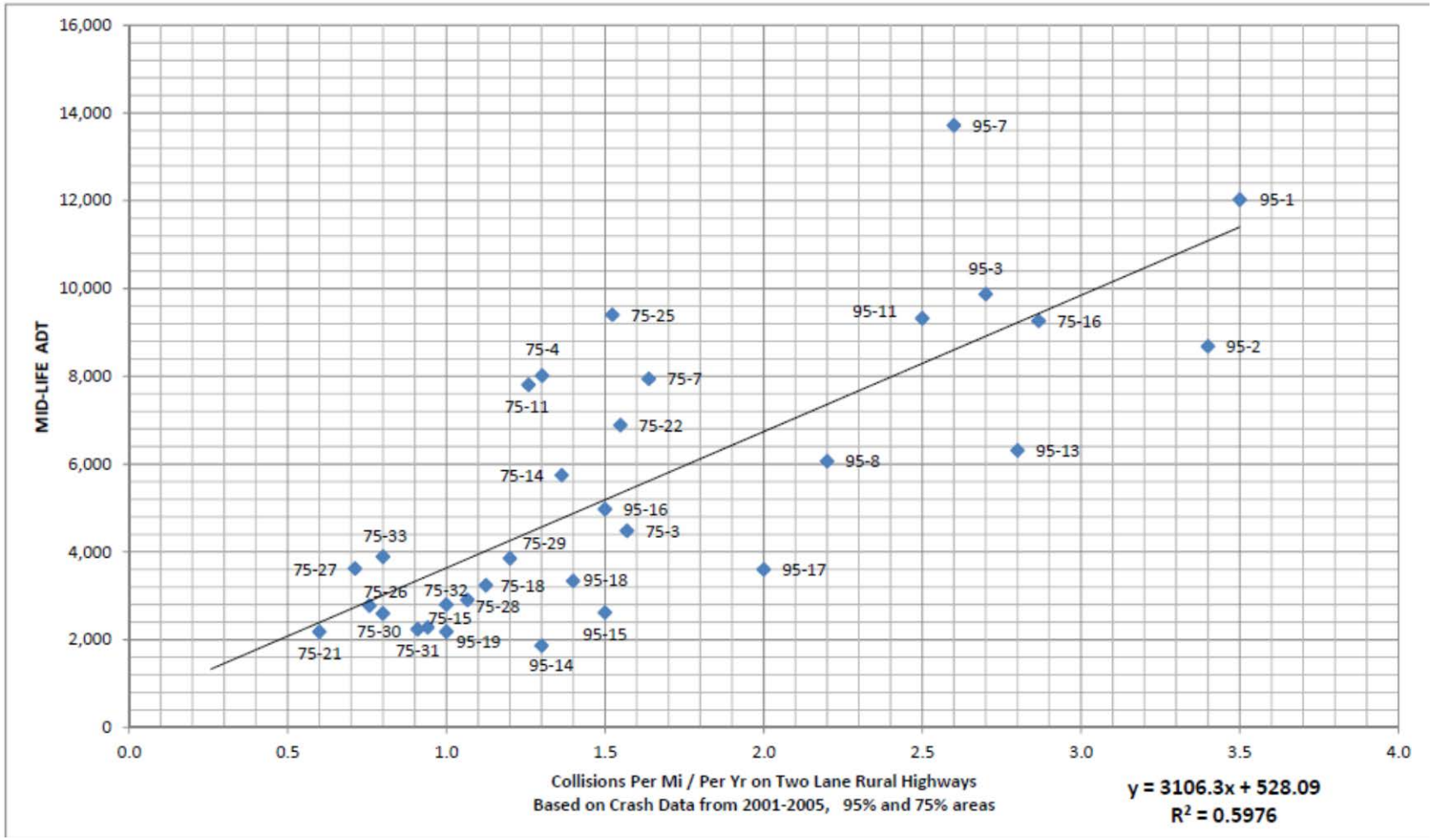

Figure 2. Correlation between increases in traffic volume and the number of moose collisions on two-lane roads at low elevations (less than 200ft) (Thomas 2012)

Appendix B
Conceptual Stage Relocation Study

Prepared for:

State of Alaska
Department of Transportation and
Public Facilities

Prepared by:
HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, Alaska 99503

February 2014

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Table of Contents

List of Tables

List of Attachments

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1. Introduction

This document supports the Draft Supplemental Environmental Impact Statement (SEIS) for the Sterling Highway Milepost 45–60 Project. The SEIS is being prepared by HDR Alaska, Inc., on behalf of the Alaska Department of Transportation and Public Facilities (DOT&PF) and Federal Highway Administration (FHWA). The purpose of this study is to identify properties that may be acquired for construction of the SEIS build alternatives, including a description of relocation requirements, where applicable, for both residential and commercial properties potentially affected. There are other costs associated with right-of-way that are not provided in this report and will not be determined until after the final design is complete and negotiations have taken place between the State of Alaska and affected property owners. This report provides the following:

- An estimate of the number of households that could be relocated, by alternative.
- Verification of available decent, safe, and sanitary housing in the area.
- An estimate of the businesses that may be displaced with each alternative and the number of employees potentially affected.
- This statement: The acquisition and relocation program for the project will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and relocation resources will be made available to all residential and business relocatees without discrimination.

2. Relocation Assistance

The purpose of relocation assistance is to ensure that persons displaced as a direct result of Federal or Federally assisted projects are treated fairly, consistently, and equitably so that such displaced persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. As a means of providing uniform and equitable treatment for those persons displaced, the government passed the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and the Uniform Relocation Act Amendments of 1987 and 2005. This legislation provides for fair, uniform, and equitable treatment of persons displaced from their homes, businesses, or farms by Federal and Federally assisted programs and establishes fair, uniform, and equitable land acquisition policies for Federal and Federally assisted programs. Whenever the acquisition of real property for a program or project by a Federal agency results in displacement of anyone, the agency is required to determine any reimbursements due to displacees and provide relocation planning, advisory services, and coordination (49 CFR Part 24).

Through the acquisition process, all property owners, without discrimination, would be compensated for their loss of real property at fair market value. In addition, those who meet the definition of a displacee under 49 CFR Part 24.2 can qualify for relocation benefits. Relocations would be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act), and relocation assistance would be

made available to all lawful residential, businesses, farms, and non-profit organizations that would be affected by the Sterling Highway MP 45–60 Project.

3. Relocation Requirements

Owners and qualified renters are entitled to reimbursement of reasonable and necessary moving costs and certain related expenses incurred in moving, such as disconnecting, dismantling, removing, reassembling, and reinstalling qualified personal property items. Per 49 CFR 24.301(g), a move benefit can be computed up to a 50-mile radius. Transportation beyond the 50-mile radius is not eligible, unless the State determines that relocation beyond 50 miles is justified on a case-by-case basis. Any owner-occupant or tenant who qualifies as a displaced person (defined at 49 CFR Part 24.2 [a] [9]) and who moves from a dwelling (including a mobile home) or who moves from a business, farm, or non-profit organization is entitled to payment of their actual moving expenses and related expenses, as the State determines to be reasonable and necessary. A displaced person's actual, reasonable, and necessary moving expenses for moving of personal property from a dwelling may be determined based upon the cost of one of the following, or a combination of the following: a commercial move, a self-move, or a fixed residential moving cost schedule. A displaced person's actual, reasonable, and necessary moving expenses for moving of personal property from a business, farm, or non-profit organization may be determined based upon the cost of a commercial move, the lower of two bids or estimates from commercial movers, or actual receipts. Prior to any move taking place, it is important that the relocation agent and the displaced persons have coordinated the move process. For businesses, there are also discretionary utility relocation payments that are used for extraordinary expense purposes only, as described in 49 CFR Part 24.306.

In addition to moving benefits, a displaced person may qualify for Replacement Housing Payments. These payments are supplements to the displaced person(s); they are separated into the following four basic types and are dependent upon whether the resident is a long-term owner (having occupied the residence for at least 180 days) or a tenant (having occupied the dwelling for at least 90 days), and how long they have lived in the property being acquired prior to the initiation of negotiations:

- **Replacement Housing Payment for 180-day homeowner-occupants** – The replacement housing payment for an eligible 180-day homeowner-occupant may not exceed $22,500. The payment up to this maximum is limited to the amount necessary to relocate to a comparable replacement dwelling. The total amount of this payment must be applied toward the purchase of a decent, safe, and sanitary replacement dwelling.

- **Replacement Housing Payment for 90-day occupants** – A tenant or owner-occupant displaced from a dwelling is entitled to a payment not to exceed $5,250 for rental assistance.

- **Rental Assistance Payment** – An eligible displaced person who rents a replacement dwelling is entitled to a payment not to exceed $5,250 for rental assistance. This payment is 42 times the amount obtained by subtracting the base monthly rental for the displacement dwelling from the lesser of the monthly rent and estimated average monthly cost of utilities for a comparable replacement dwelling or the monthly rent and estimated

average monthly cost of utilities for the decent, safe, and sanitary replacement dwelling actually occupied by the displacee.

- **Down Payment Assistance** – An eligible displaced person who purchases a replacement dwelling is entitled to a down payment assistance payment in the amount the person would receive under the Replacement Housing Payment for 90-day occupants, if the person rented a comparable replacement dwelling. At the Agency's discretion, a down payment assistance payment that is less than $5,250 may be increased to any amount not to exceed $5,250. The payment to a displaced homeowner shall not exceed the amount the owner would receive under the 180-day occupancy requirement. A displaced person eligible for a payment as a 180-day owner-occupant is not eligible for this payment.

In order for any of the above payments to be made, the full amount of the replacement housing payment or down payment assistance must be applied to the purchase price of the replacement dwelling and related incidental expenses. The expenses must be incurred and the replacement housing must meet the decent, safe, and sanitary requirements.

4. Environmental Justice

This section addresses Environmental Justice Executive Order 12898:

> *Each federal agency shall make achieving environmental justice part of its mission by identifying and addressing as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations or low-income populations.*

FHWA order 6640.23, "FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," contains the following definitions:

- **Low-Income:** A household income at or below the poverty guidelines of the U.S. Department of Health and Human Services.

- **Minorities:**

    - Black (having origins in any of the Black racial groups of Africa).

    - Hispanic (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race).

    - Asian-American (having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent).

    - American Indian or Alaskan Native (having origins in any of the original people of North America and who maintain cultural identification through tribal affiliation or community recognition).

- Native Hawaiian and Other Pacific Islander (having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands).

The FHWA also defines a "disproportionately high and adverse effect on minority and low-income populations" as follows:

> *An adverse effect that is predominately borne by a minority population and/or a low-income population; or will be suffered by the minority population and/or low-income population, and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the nonminority population and/or non-low-income population.*

The above right-of-way and relocation requirements are addressed in the discussion of alternatives in Section 6.0. Because the project would result in relatively few displacements, information on race, ethnicity, and income levels is not included in this document in order to protect the privacy of those affected.

5. Methods

To determine impacts to properties from the Sterling Highway MP 45–60 Project alternatives, the proposed rights-of-way for the build alternatives were overlain onto aerial photographs to identify properties that would be acquired or severely affected. Current Kenai Peninsula Borough cadastral data, including tax assessment records, were incorporated into the analysis to ascertain the ownership type, improvement status (developed versus vacant), and assessed values of the affected parcels. For planning purposes, to assess parcel acquisition, a 50 percent rule was applied to affected parcels where, if greater or equal to approximately 50 percent of the parcel would be impacted, the parcel was considered a full acquisition. Also, where the right-of-way limit would cross improved residential parcels and would include the structure, the parcel was considered a full acquisition. Additionally, if the build alternative removed access to the parcel or resulted in a remnant that would not be economically viable, professional judgment was rendered and the parcel was considered a full acquisition.

Research into available housing resources was conducted by searching the Alaska Multiple Listing Services for Cooper Landing and the surrounding area. The search results are current as of November 2013; at the time properties are acquired, a specific search for homes comparable to those from which the persons are being relocated would be identified, and supplemental housing payments offered based upon the provisions in State and Federal laws.

6. Property Impacts by Build Alternative

Both government and privately owned properties would be acquired for the right-of-way for any of the build alternatives. Table 1 details the number of affected parcels by ownership type for the build alternatives.

Table 1. Sterling Highway MP 45–60 Project parcel acquisition, by alternative

Ownership and acquisition type	Cooper Creek	G South	Juneau Creek	Juneau Creek Variant
Federal	**4**	**4**	**5**	**4**
Full Parcel	0	0	0	0
Part of Parcel	4	4	5	4
State	**5**	**4**	**5**	**5**
Full Parcel	1	0	0	0
Part of Parcel	4	4	5	5
Borough	**9**	**17**	**17**	**17**
Full Parcel	2	4	4	4
Part of Parcel	7	13	13	13
Native Corp.	**2**	**2**	**0**	**1**
Full Parcel	0	0	0	0
Part of Parcel	2	2	0	1
Private	**38**	**4**	**4**	**4**
Full Parcel	16	0	0	0
Part of Parcel	22	4	4	4
Total	**58**	**31**	**31**	**31**

Residents displaced by a Federal program generally are relocated to existing housing in the community, although market conditions may require relocation outside the community of present residence. Further, people asked to move because of transportation projects frequently choose to relocate into housing circumstances significantly different from their present housing. Changes typically made are different communities, different housing styles and sizes, and occupancy status (owner vs. renter).

As a part the Sterling Highway MP 45–60 Project, all persons who would be permanently displaced from their homes would be offered the relocation assistance benefits provided for in the Uniform Act. This assistance would include personal services to assist in locating housing; monies to pay for the cost of moving personal property from acquired dwellings; and housing payments to assist in the cost of securing decent safe and sanitary housing to move into. If no replacement housing were available, "last resort housing" (further measures to ensure reasonable housing for all displaced persons) would be provided as required by the Uniform Act.

6.1 Cooper Creek Alternative

The Cooper Creek Alternative generally follows the existing Sterling Highway alignment. It passes through a portion of Cooper Landing and routes 3.5 miles of new highway south of a portion of Cooper Landing (between approximately MP 46 and MP 48.5). The necessary right-of-way would affect 58 individual parcels—5 are State-owned, including 1 total acquisition; 9

are Borough-owned, 2 of which would be total acquisitions; 4 are Federally owned; 2 are Native-owned; and 38 are privately owned. Of the 38 private parcels, 16 would be total acquisitions.

According to 2013 Kenai Peninsula Borough tax assessment information, the 16 total acquisitions include 7 residential parcels with structural improvements to the properties (requiring relocation); 1 property with a residence owned by the Kenai Lake Baptist Church (requiring relocation); 6 vacant residential parcels; and 2 residential accessory building parcels. The total assessed property values of the total acquisitions range from approximately $140,000 to $315,000. None of the partial acquisitions would require the relocation of any residences, businesses, farms, or non-profit organizations.

There are limited numbers of residential properties available for sale in Cooper Landing, and available housing may not be adequate to accommodate the relocations at the time of displacement. According to local real estate listings from research conducted in November 2013, three comparable residences in the $200,000 to $350,000 price range were available in Cooper Landing (Table 2). Of the eight displaced residences, five residences have an assessed value within this price range; comparable housing for three residences valued at less than $200,000 is not currently available within Cooper Landing. FHWA regulations found at 49 CFR 24.301(g) provide for relocations and transportation expenses for displaced persons for moves up to 50 miles away. Within 50 miles of Cooper Landing are the larger communities of Seward, Sterling, and Soldotna, where sufficient replacement housing exists (see Attachment A). An update will be made on the availability of replacement housing for the final EIS.

Table 2. Cooper Landing residences for sale in $200,000 to $350,000 price range

Style	Single family house	Price range*
1 Bedroom	1	$219,000
2 Bedrooms	0	-
3 Bedrooms	2	$289,000–$325,000
4 Bedrooms	0	-

* No residences priced at less than $200,000 were available at the time of research.

6.2 G South Alternative

The G South Alternative would include approximately 5.6 miles of new alignment north of the existing Sterling Highway, between approximately MP 46.3 and MP 55.6. This alternative requires the construction of new bridges across the Kenai River and Juneau Creek, and bridge replacement at Schooner Bend. The construction of right-of-way would require full acquisition of 4 vacant Borough-owned parcels. Right-of-way requirements would also result in partial acquisition of 4 privately owned properties, 13 Borough-owned properties, 4 State-owned properties, 4 Federally owned properties, and 2 Native-owned parcels. None of the full or partial property acquisitions would require the relocation of any residences, businesses, farms, or non-profit organizations.

6.3 Juneau Creek Alternative

The Juneau Creek Alternative provides approximately 10 miles of new roadway alignment, from MP 46 to west of Sportsman's Landing at MP 55.5. The construction of right-of-way would require full acquisition of 4 vacant Borough-owned parcels. Right-of-way would also require partial acquisitions of 4 privately owned properties, 13 Borough-owned parcels, 5 State-owned parcels, and five Federally owned parcels. None of the full or partial acquisitions would require the relocation of any residences, businesses, farms, or non-profit organizations.

6.4 Juneau Creek Variant Alternative

The Juneau Creek Variant Alternative would be the same as the Juneau Creek Alternative, described above, except for a stretch of about 3.2 miles just east of Sportsman's Landing. To avoid impact to the Mystery Creek Wilderness within the Kenai National Wildlife Refuge (the key difference between the alternatives), the variant would connect to the old highway alignment at existing MP 55, within the existing highway right-of-way at the Refuge boundary. The construction of right-of-way would require full acquisition of 4 vacant Borough-owned parcels. Right-of-way would also require partial acquisitions of 4 privately owned properties, 13 Borough-owned parcels, 5 State-owned parcels, 4 Federally owned parcels, and 1 Native-owned parcel. None of the full or partial acquisitions would require the relocation of any residences, businesses, farms, or non-profit organizations.

6.5 No Build Alternative

The No Build Alternative does not require any acquisitions or relocations. The No Build Alternative would not impact any residences, businesses, farms, or non-profit organizations.

7. Conclusion

The Cooper Creek Alternative is the only build alternative that would result in relocations of any kind. The Cooper Creek Alternative would require total acquisition and relocation of eight residential properties. The G South, Juneau Creek, and Juneau Creek Variant alternatives would leave the existing roadway through Cooper Landing in place and would develop a route around the community. These alternatives would require total acquisition of four vacant, Borough-owned parcels but would not require total acquisition of any residential or commercial properties. The G South, Juneau Creek, and Juneau Creek Variant alternatives would not require the relocation of any residences, businesses, farms, or non-profit organizations.

The No Build Alternative would leave everything as it currently exists. It would not require the acquisition of any residential or commercial properties.

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Sterling Highway MP 45–60 Draft SEIS Project
Conceptual Stage Relocation Study

Attachment A

Multiple Listing Service Search—Cooper Landing

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Welcome to AlaskaRealEstate.com

Alaska Multiple Listing Service public website – The single greatest source of properties for sale or lease in Alaska.

Search filtering:

Primary Sort Order:
Closest Town
Ascending Descending

Secondary Sort Order:
Listing Number
Ascending Descending

Show 10 Results Per Page

Refresh Search

Did You Know?

Points – This can be a confusing term and is best explained by your real estate professionals. The most basic definition is that a "point" is a dollar amount equal to 1% of your loan. Lenders may charge points for processing your loan and may offer you a lower interest rate if you pay points to them up front.

Map Results | << Previous | Next >>
1 - 8 of 8 | New Search | Modify Current Search

1.
Listing #: 13-180 Price: $439,900 Closest Town: Cooper Landing
18156 Sterling Highway
(VIEW DETAILS)

Beds: 4 **Type:** Single Family Res, B & B Potential
Baths: 2 **Style:** Two-Story W/Basement
Garage/Carport: 0 / 2 **Year Built/Remodeled:** 1977 / 2012
Square Feet: 3320 **Zoning:** UNK
Lot Sq. Ft.: 29185 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 0.67

2.
Listing #: 13-1032 Price: $219,000 Closest Town: Cooper Landing
17921 Sterling Highway
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res, Recreational
Baths: 0 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2004
Square Feet: 655 **Zoning:** UNZ
Lot Sq. Ft.: 161172 **Listing Office:** Century 21 Freedom Realty - Kenai
Acreage: 3.7

3.
Listing #: 13-6140 Price: $495,000 Closest Town: Cooper Landing
35093 Quartz Creek Road
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 1.5 **Style:** Ranch
Garage/Carport: 0 / 2 **Year Built/Remodeled:** 1955 / 1995
Square Feet: 1987 **Zoning:** UNZ
Lot Sq. Ft.: 28314 **Listing Office:** Century 21 Freedom Realty - Kenai
Acreage: 0.65

4.
Listing #: 13-7962 Price: $1,200,000 Closest Town: Cooper Landing
18112 Sterling Highway
(VIEW DETAILS)

Beds: 5 **Type:** Single Family Res, Recreational, B & B Potential
Baths: 2.75 **Style:** Two-Story W/Basement
Garage/Carport: 2 / 1 **Year Built/Remodeled:** 2001 / 2003
Square Feet: 2636 **Zoning:** UNZ
Lot Sq. Ft.: 40075 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.92

5.
Listing #: 13-10246 Price: $325,000 Closest Town: Cooper Landing
17373 Bean Creek Road
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 3 **Style:** Two-Story
Garage/Carport: 2 / 1 **Year Built/Remodeled:** 2008
Square Feet: 2430 **Zoning:** UNZ
Lot Sq. Ft.: 40075 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 0.92

6.
Listing #: 13-13240 Price: $289,000 Closest Town: Cooper Landing
37950 Snug Harbor
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Hillside Ranch/Daylight Basement
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2002 / 2012
Square Feet: 1792 **Zoning:** UNZ
Lot Sq. Ft.: 20400 **Listing Office:** Jack White Real Estate
Acreage: 0.47

7.
Listing #: 13-14526 Price: $375,000 Closest Town: Cooper Landing
34490 E Quartz Creek Road
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res, Recreational
Baths: 1.5 **Style:** Cabin, Chalet/A-Frame, Multi-Level
Garage/Carport: 0 / 1 **Year Built/Remodeled:** 1996
Square Feet: 1382 **Zoning:** UNZ
Lot Sq. Ft.: 42689 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.98

8.
Listing #: 13-14678 Price: $429,000 Closest Town: Cooper Landing

Send feedback

New Listing

19852 Sterling Highway
(VIEW DETAILS)

Beds: 3
Baths: 2
Garage/Carport: 0 / 2
Square Feet: 1776
Lot Sq. Ft.: 60548
Acreage: 1.39

Type: Single Family Res, B & B Potential
Style: Multi-Level
Year Built/Remodeled: 1986
Zoning: UNK
Listing Office: Alaska Real Estate Alliance

Map Results | << Previous | Next >>
1 - 8 of 8 | **New Search** | **Modify Current Search**

Listing content updated 11/5/2013 7:34 AM

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Search filtering:

Primary Sort Order:
Closest Town
Ascending Descending

Secondary Sort Order:
Price
Ascending Descending

Show 10 Results Per Page

Refresh Search

Did You Know?

Closing – The term "Closing" refers to the signing of the final documents that officially transfer ownership of the home from the seller to the buyer. If you have never purchased a home before or if it has been a while since you have, it is likely you will be surprised by the vast amount of paperwork you will be expected to review and sign.

1.
Listing #: 13-1032 Price: $219,000 Closest Town: Cooper Lan

17921 Sterling Highway
(VIEW DETAILS)
Beds: 1 **Type:** Single Family Res, Recr
Baths: 0 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2004
Square Feet: 655 **Zoning:** UNZ
Lot Sq. Ft.: 161172 **Listing Office:** Century 21 Fre
Acreage: 3.7

2.
Listing #: 13-13240 Price: $289,000 Closest Town: Cooper Lan

37950 Snug Harbor
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Hillside Ranch/Daylight E
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2002 /
Square Feet: 1792 **Zoning:** UNZ
Lot Sq. Ft.: 20400 **Listing Office:** Jack White Rea
Acreage: 0.47

3.
Listing #: 13-10246 Price: $325,000 Closest Town: Cooper Lan

17373 Bean Creek Road
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res
Baths: 3 **Style:** Two-Story
Garage/Carport: 2 / 1 **Year Built/Remodeled:** 2008
Square Feet: 2430 **Zoning:** UNZ
Lot Sq. Ft.: 40075 **Listing Office:** Chris Druesedo
Acreage: 0.92

4.
Listing #: 13-14526 Price: $375,000 Closest Town: Cooper Lan

34490 E Quartz Creek Road
(VIEW DETAILS)
Beds: 1 **Type:** Single Family Res, Recr
Baths: 1.5 **Style:** Cabin, Chalet/A-Frame,
Garage/Carport: 0 / 1 **Year Built/Remodeled:** 1996
Square Feet: 1382 **Zoning:** UNZ
Lot Sq. Ft.: 42689 **Listing Office:** Century 21 Fre
Acreage: 0.98

5.
Listing #: 13-14678 Price: $429,000 Closest Town: Cooper Lan
19852 Sterling Highway
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res, B & E

Send feedback

New Listing

Baths: 2
Garage/Carport: 0 / 2
Square Feet: 1776
Lot Sq. Ft.: 60548
Acreage: 1.39

Style: Multi-Level
Year Built/Remodeled: 1986
Zoning: UNK
Listing Office: Alaska Real Es

6.

Listing #: 13-180 **Price: $439,900** **Closest Town: Cooper Lan**

18156 Sterling Highway
(VIEW DETAILS)

Beds: 4
Baths: 2
Garage/Carport: 0 / 2
Square Feet: 3320
Lot Sq. Ft.: 29185
Acreage: 0.67

Type: Single Family Res, B & E
Style: Two-Story W/Basement
Year Built/Remodeled: 1977 /
Zoning: UNK
Listing Office: Chris Druesedo

7.

Listing #: 13-6140 **Price: $495,000** **Closest Town: Cooper Lan**

35093 Quartz Creek Road
(VIEW DETAILS)

Beds: 3
Baths: 1.5
Garage/Carport: 0 / 2
Square Feet: 1987
Lot Sq. Ft.: 28314
Acreage: 0.65

Type: Single Family Res
Style: Ranch
Year Built/Remodeled: 1955 /
Zoning: UNZ
Listing Office: Century 21 Fre

8.

Listing #: 13-7962 **Price: $1,200,000** **Closest Town: Cooper Lan**

18112 Sterling Highway
(VIEW DETAILS)

Beds: 5
Baths: 2.75
Garage/Carport: 2 / 1
Square Feet: 2636
Lot Sq. Ft.: 40075
Acreage: 0.92

Type: Single Family Res, Recr
Style: Two-Story W/Basement
Year Built/Remodeled: 2001 /
Zoning: UNZ
Listing Office: Century 21 Fre

9.

Listing #: 13-11266 **Price: $189,000** **Closest Town: Moose Pass**

40294 Seward Highway
(VIEW DETAILS)

Beds: 1
Baths: 1
Garage/Carport: 0 / 0
Square Feet: 992
Lot Sq. Ft.: 93654
Acreage: 2.15

Type: Single Family Res, Recr
Style: Chalet/A-Frame, Multi-Le
Year Built/Remodeled: 1996
Zoning: UNZ
Listing Office: Century 21 Fre

10.

Listing #: 13-267 **Price: $55,000** **Closest Town: Seward**

32466 Caines Head Road
(VIEW DETAILS)

Beds: 0
Baths: 0
Garage/Carport: 0 / 0
Square Feet: 224
Lot Sq. Ft.: 49658
Acreage: 1.14

Type: Recreational
Style: Cabin, Chalet/A-Frame
Year Built/Remodeled: 2001
Zoning: UNZ
Listing Office: Integrity Realty

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Did You Know?

Bill of Sale – A written agreement in which certain mutually agreed upon items of **"Personal Property"** are transferred from the seller to the buyer.

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11.
Listing #: 13-1797 Price: $65,000 Closest Town: Seward
32446 Caines Head Road
(VIEW DETAILS)

Beds: 1 **Type:** Recreational
Baths: 0 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2001
Square Feet: 392 **Zoning:** UNZ
Lot Sq. Ft.: 43560 **Listing Office:** Integrity Realty
Acreage: 1

12.
Listing #: 13-14542 Price: $69,500 Closest Town: Seward
1721 Phoenix Road
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res
Baths: 1 **Style:**
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 1947
Square Feet: 731 **Zoning:** R1
Lot Sq. Ft.: 8712 **Listing Office:** Seward Real Estate Company
Acreage: 0.2

13.
Listing #: 13-1068 Price: $79,500 Closest Town: Seward
11521 Eagle Lane
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res, Recreational
Baths: 1 **Style:** Ranch
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1978 / 2005
Square Feet: 1125 **Zoning:** UNZ
Lot Sq. Ft.: 12197 **Listing Office:** Integrity Realty
Acreage: 0.28

14.
Listing #: 12-15032 Price: $85,000 Closest Town: Seward
32223 Bear Chase Circle
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res
Baths: 1 **Style:** Chalet/A-Frame
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2003
Square Feet: 765 **Zoning:** UNZ
Lot Sq. Ft.: 54014 **Listing Office:** Integrity Realty
Acreage: 1.24

15.
Listing #: 12-14863 Price: $115,000 Closest Town: Seward
33856 Orlander Avenue
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res, Recreational
Baths: 1 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1996
Square Feet: 216 **Zoning:** UNZ
Lot Sq. Ft.: 64904 **Listing Office:** Integrity Realty
Acreage: 1.49

16.
Listing #: 13-14292 Price: $129,900 Closest Town: Seward
12078 Rail Court
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res, Recreational
Baths: 1 **Style:** Cabin, Multi-Level
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2008
Square Feet: 800 **Zoning:** R1
Lot Sq. Ft.: 40075 **Listing Office:** Seward Real Estate Company
Acreage: 0.92

17.
Listing #: 13-3885 Price: $149,500 Closest Town: Seward
12215 Meridian Avenue
(VIEW DETAILS)

Beds: 2 **Type:** Single Family Res, Recreational
Baths: 1 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2000
Square Feet: 921 **Zoning:** R1
Lot Sq. Ft.: 86684 **Listing Office:** Seward Real Estate Company
Acreage: 1.99

18.
Listing #: 13-364 Price: $154,900 Closest Town: Seward

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33605 Rabbit Run
(VIEW DETAILS)

Beds: 4
Baths: 2
Garage/Carport: 0 / 0
Square Feet: 1430
Lot Sq. Ft.: 17860
Acreage: 0.41

Type: ZLL-Attached
Style:
Year Built/Remodeled: 1955 / 2002
Zoning: UNZ
Listing Office: Seward Real Estate Company

19.

Listing #: 13-15650 **Price: $165,000** **Closest Town: Seward**

228 Fifth Avenue
(VIEW DETAILS)

New Listing

Beds: 2
Baths: 1.5
Garage/Carport: 0 / 0
Square Feet: 1521
Lot Sq. Ft.: 8276
Acreage: 0.19

Type: Single Family Res
Style: Two-Story
Year Built/Remodeled: 1942
Zoning: CBD
Listing Office: Integrity Realty

20.

Listing #: 13-5567 **Price: $175,000** **Closest Town: Seward**

1902 Dora Way
(VIEW DETAILS)

Beds: 3
Baths: 1.5
Garage/Carport: 1 / 0
Square Feet: 1270
Lot Sq. Ft.: 6970
Acreage: 0.16

Type: Single Family Res
Style: Multi-Level
Year Built/Remodeled: 1988
Zoning: R1
Listing Office: Integrity Realty

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21.
Listing #: 13-12894 Price: $179,000 Closest Town: Seward

528 Sixth Avenue
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1954
Square Feet: 1272 **Zoning:** UR
Lot Sq. Ft.: 6098 **Listing Office:** Integrity Realty
Acreage: 0.14

22.
Listing #: 11-7410 Price: $190,000 Closest Town: Seward

14836 Willow Drive
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Ranch
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2008
Square Feet: 1120 **Zoning:** UNZ
Lot Sq. Ft.: 53579 **Listing Office:** Integrity Realty
Acreage: 1.23

23.
Listing #: 13-14251 Price: $195,000 Closest Town: Seward

13335 Bruno Road
(VIEW DETAILS)
Beds: 4 **Type:** Single Family Res
Baths: 1 **Style:** Two-Story
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2008
Square Feet: 2040 **Zoning:** UNZ
Lot Sq. Ft.: 43996 **Listing Office:** Integrity Realty
Acreage: 1.01

24.
Listing #: 13-3758 Price: $205,000 Closest Town: Seward

520 Sixth Avenue
(VIEW DETAILS)
Beds: 4 **Type:** Single Family Res
Baths: 2.25 **Style:** Two-Story
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1954
Square Feet: 2544 **Zoning:** UR
Lot Sq. Ft.: 6098 **Listing Office:** Soldotna Realty
Acreage: 0.14

25.
Listing #: 13-15000 Price: $224,500 Closest Town: Seward

New Listing
422 4th Avenue
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 1.75 **Style:** Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1953 / 2010
Square Feet: 1700 **Zoning:** R1
Lot Sq. Ft.: 10454 **Listing Office:** CENTURY 21 North Homes Realty - Anchorage
Acreage: 0.24

26.
Listing #: 13-14299 Price: $230,000 Closest Town: Seward

14411 Seward
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res
Baths: 1 **Style:** Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1986 / 2011
Square Feet: 2020 **Zoning:** R1
Lot Sq. Ft.: 40075 **Listing Office:** Keller Williams Realty Alaska Group
Acreage: 0.92

27.
Listing #: 13-7530 Price: $260,000 Closest Town: Seward

1901 Jesse Lee Drive
(VIEW DETAILS)
Beds: 5 **Type:** Single Family Res
Baths: 3 **Style:** Two-Story Reverse
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1999
Square Feet: 2100 **Zoning:** R1
Lot Sq. Ft.: 11761 **Listing Office:** Integrity Realty
Acreage: 0.27

28.
Listing #: 13-6870 Price: $270,000 Closest Town: Seward

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Did You Know?

Down Payment – The down payment is the money that you will put down from your savings or other sources towards the purchase of your new home. Minimum down payment requirements are different from lender to lender so you will want to research the options that best meet your needs and resources. Click here to see a **list of lenders** or ask your real estate professional to help guide you to a reliable source.

1601 Bayview Place
(VIEW DETAILS)

Beds: 3
Baths: 2
Garage/Carport: 0 / 0
Square Feet: 2688
Lot Sq. Ft.: 9148
Acreage: 0.21

Type: Single Family Res
Style: Two-Story Reverse
Year Built/Remodeled: 1965
Zoning: R1
Listing Office: Integrity Realty

29.

Listing #: 13-14504 **Price: $279,000** **Closest Town: Seward**

330 2nd Avenue
(VIEW DETAILS)

Beds: 3
Baths: 2.5
Garage/Carport: 2 / 0
Square Feet: 3300
Lot Sq. Ft.: 6098
Acreage: 0.14

Type: Single Family Res, B & B Potential
Style: Two-Story W/Basement
Year Built/Remodeled: 1930
Zoning: R1
Listing Office: CENTURY 21 North Homes Realty - Anchorage

30.

Listing #: 13-14313 **Price: $285,000** **Closest Town: Seward**

14815 Willow Drive
(VIEW DETAILS)

Beds: 3
Baths: 2.5
Garage/Carport: 2 / 0
Square Feet: 1913
Lot Sq. Ft.: 50965
Acreage: 1.17

Type: Single Family Res
Style: Multi-Level
Year Built/Remodeled: 1998
Zoning: R1
Listing Office: Seward Real Estate Company

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Did You Know?

A real estate professional can help you objectively evaluate every buyer's proposal without compromising your marketing position. **Contact one today!**

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31.
Listing #: 13-14038 Price: $289,000 Closest Town: Seward
14527 Abigail Circle
(VIEW DETAILS)

Beds: 4 **Type:** Single Family Res, B & B Potential
Baths: 3 **Style:** Chalet/A-Frame, Multi-Level
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1980 / 2005
Square Feet: 2355 **Zoning:** R1
Lot Sq. Ft.: 65776 **Listing Office:** Marathon Trust Real Estate
Acreage: 1.51

32.
Listing #: 11-3755 Price: $292,500 Closest Town: Seward
525 Ballaine Boulevard
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1954 / 2005
Square Feet: 1272 **Zoning:** UR
Lot Sq. Ft.: 6098 **Listing Office:** Integrity Realty
Acreage: 0.14

33.
Listing #: 13-14037 Price: $295,000 Closest Town: Seward
12408 Lancelot Drive
(VIEW DETAILS)

Beds: 2 **Type:** Single Family Res, B & B Potential
Baths: 2 **Style:** Chalet/A-Frame, Log, Multi-Level
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 1983 / 2002
Square Feet: 2694 **Zoning:** UNK
Lot Sq. Ft.: 105851 **Listing Office:** Marathon Trust Real Estate
Acreage: 2.43

34.
Listing #: 12-7789 Price: $310,000 Closest Town: Seward
14812 Willow Drive
(VIEW DETAILS)

Beds: 4 **Type:** Single Family Res
Baths: 2.5 **Style:** Split Entry
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2001
Square Feet: 2142 **Zoning:** UNZ
Lot Sq. Ft.: 55321 **Listing Office:** Integrity Realty
Acreage: 1.27

35.
Listing #: 13-3512 Price: $349,000 Closest Town: Seward
1902 Swetmann
(VIEW DETAILS)

Beds: 4 **Type:** Single Family Res
Baths: 3 **Style:** Two-Story
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1998
Square Feet: 2072 **Zoning:** R1
Lot Sq. Ft.: 14810 **Listing Office:** Tri-Star Realty
Acreage: 0.34

36.
Listing #: 13-6871 Price: $349,900 Closest Town: Seward
527 First Avenue
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res
Baths: 2 **Style:** Multi-Level
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2006
Square Feet: 1415 **Zoning:** R1
Lot Sq. Ft.: 10890 **Listing Office:** Integrity Realty
Acreage: 0.25

37.
Listing #: 13-12039 Price: $399,000 Closest Town: Seward
33532 Vinewood
(VIEW DETAILS)

Beds: 5 **Type:** Single Family Res, B & B in Operation, B & B Potential
Baths: 3.5 **Style:** Multi-Level
Garage/Carport: 3 / 0 **Year Built/Remodeled:** 1999
Square Feet: 5774 **Zoning:** R1
Lot Sq. Ft.: 219107 **Listing Office:** Seward Real Estate Company
Acreage: 5.03

38.
Listing #: 13-8982 Price: $445,000 Closest Town: Seward

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10912 Wolf Trail
(VIEW DETAILS)

Beds: 3
Baths: 3
Garage/Carport: 1 / 0
Square Feet: 3175
Lot Sq. Ft.: 169448
Acreage: 3.89

Type: Single Family Res
Style: Multi-Level
Year Built/Remodeled: 2005
Zoning: UNZ
Listing Office: Integrity Realty

39.

Listing #: 13-6867 **Price: $485,000** **Closest Town: Seward**

2000 Phoenix Road
(VIEW DETAILS)

Beds: 8
Baths: 5
Garage/Carport: 2 / 0
Square Feet: 4686
Lot Sq. Ft.: 26136
Acreage: 0.6

Type: Single Family Res, B & B in Operation, B & B Potential
Style: Two-Story W/Basement
Year Built/Remodeled: 1991 / 1993
Zoning: R1
Listing Office: Keller Williams Realty Alaska Group of Eagle River

40.

Listing #: 13-14225 **Price: $554,500** **Closest Town: Seward**

14150 Beach Drive
(VIEW DETAILS)

Beds: 3
Baths: 3
Garage/Carport: 1 / 0
Square Feet: 2366
Lot Sq. Ft.: 46174
Acreage: 1.06

Type: Single Family Res
Style: Multi-Level
Year Built/Remodeled: 1995
Zoning: UNZ
Listing Office: Integrity Realty

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41.

Listing #: 13-8252 **Price: $559,000** **Closest Town: Seward**

403 Ballaine Boulevard
(VIEW DETAILS)

Beds: 4
Baths: 3.5
Garage/Carport: 2 / 0
Square Feet: 3098
Lot Sq. Ft.: 6098
Acreage: 0.14

Type: Single Family Res
Style: Two-Story W/Basement
Year Built/Remodeled: 2003
Zoning: AC
Listing Office: Integrity Realty

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Did You Know?

Offer – Offer refers to the amount that the interested home buyer "offers" to the seller for the purchase of a property offered for sale. The offer will be written up and formally by your licensee/broker and presented to the seller's licensee/broker for consideration.

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1.

Listing #: 10-14130	Price: $255,000	Closest Town: Sterling

37837 Three Johns Road
(VIEW DETAILS)

Beds: 4 **Type:** Single Family Res
Baths: 3 **Style:** Two-Story
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2000
Square Feet: 2020 **Zoning:** UNZ
Lot Sq. Ft.: 460865 **Listing Office:** Stenga Real Estate Group
Acreage: 10.58

2.

Listing #: 11-2618	Price: $142,000	Closest Town: Sterling

39450 Redman Street
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 1 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1996
Square Feet: 1008 **Zoning:** UNZ
Lot Sq. Ft.: 66647 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 1.53

3.

Listing #: 12-8950	Price: $374,900	Closest Town: Sterling

36910 Rodelee Lane
(VIEW DETAILS)

Beds: 4 **Type:** Single Family Res, B & B Potential
Baths: 3 **Style:** Two-Story W/Basement
Garage/Carport: 3 / 0 **Year Built/Remodeled:** 1998
Square Feet: 2496 **Zoning:** UNZ
Lot Sq. Ft.: 31799 **Listing Office:** Mossy Oak Properties of Alaska Kenai
Acreage: 0.73

4.

Listing #: 12-11807	Price: $263,000	Closest Town: Sterling

38598 Pedersen Lane
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2.5 **Style:** Two-Story
Garage/Carport: 3 / 1 **Year Built/Remodeled:** 1997
Square Feet: 1728 **Zoning:** UNZ
Lot Sq. Ft.: 102802 **Listing Office:** Five Star Realty, LLC
Acreage: 2.36

5.

Listing #: 12-12227	Price: $295,000	Closest Town: Sterling

34697 Eagle Circle
(VIEW DETAILS)

Beds: 4 **Type:** Single Family Res
Baths: 2 **Style:** Raised Ranch
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1986
Square Feet: 2016 **Zoning:** UNK
Lot Sq. Ft.: 39640 **Listing Office:** McKay Investment Co
Acreage: 0.91

6.

Listing #: 12-13535	Price: $251,500	Closest Town: Sterling

38255 Whispering Lane
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2.5 **Style:** Multi-Level
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1979 / 2000

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Did You Know?

Home Inspection – It is considered a good idea to hire a Home Inspection company to thoroughly inspect a home you have entered into contract on to identify any maintenance and repair issues that you may wish to address prior to purchasing the home.

Square Feet: 2432 **Zoning:** UNZ
Lot Sq. Ft.: 97139 **Listing Office:** RE/MAX of The Peninsula
Acreage: 2.23

7.

Listing #: 12-13907	Price: $139,000	Closest Town: Sterling

34090 Arabian Court
(VIEW DETAILS)
Beds: 1 **Type:** Single Family Res, Recreational
Baths: 1 **Style:** Cabin, Chalet/A-Frame
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1979
Square Feet: 640 **Zoning:** UNK
Lot Sq. Ft.: 64033 **Listing Office:** Soldotna Realty
Acreage: 1.47

8.

Listing #: 12-15431	Price: $350,000	Closest Town: Sterling

30180 Wildlife Avenue
(VIEW DETAILS)
Beds: 5 **Type:** Single Family Res, B & B Potential
Baths: 4 **Style:** Prow Front Split
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2001
Square Feet: 3860 **Zoning:** UNZ
Lot Sq. Ft.: 42689 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 0.98

9.

Listing #: 12-15625	Price: $249,500	Closest Town: Sterling

38674 Pacer Street
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Raised Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2003
Square Feet: 1372 **Zoning:** UNZ
Lot Sq. Ft.: 56628 **Listing Office:** Ron Moore Company
Acreage: 1.3

10.

Listing #: 13-665	Price: $199,900	Closest Town: Sterling

35920 Sterling Highway
(VIEW DETAILS)
Beds: 5 **Type:** Single Family Res, B & B Potential
Baths: 5 **Style:** Two-Story
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 1977 / 1996
Square Feet: 3264 **Zoning:** UNZ
Lot Sq. Ft.: 50094 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 1.15

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11.

Listing #: 13-3286	Price: $114,900	Closest Town: Sterling

35153 Cherokee Lane
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res
Baths: 1 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1998
Square Feet: 768 **Zoning:** UNK
Lot Sq. Ft.: 11326 **Listing Office:** Alaska 1st Realty, Inc.
Acreage: 0.26

12.

Listing #: 13-3398	Price: $395,000	Closest Town: Sterling

38880 Moose River Drive
(VIEW DETAILS)

Beds: 4 **Type:** Single Family Res, Recreational, B & B Potential
Baths: 3 **Style:** Multi-Level
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1998
Square Feet: 2955 **Zoning:** UNZ
Lot Sq. Ft.: 104108 **Listing Office:** Crane & Associates Realty
Acreage: 2.39

13.

Listing #: 13-4280	Price: $279,900	Closest Town: Sterling

38200 Elva Street
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 4 / 0 **Year Built/Remodeled:** 1978 / 2013
Square Feet: 2262 **Zoning:** UNZ
Lot Sq. Ft.: 91040 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 2.09

14.

Listing #: 13-5139	Price: $89,000	Closest Town: Sterling

38745 Self Street
(VIEW DETAILS)

Beds: 2 **Type:** Single Family Res, Recreational
Baths: 1 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1995
Square Feet: 816 **Zoning:** UNZ
Lot Sq. Ft.: 57064 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 1.31

15.

Listing #: 13-7391	Price: $299,990	Closest Town: Sterling

37245 Coursen Street
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 3 **Style:** Multi-Level
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1978
Square Feet: 2765 **Zoning:** UNZ
Lot Sq. Ft.: 208217 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 4.78

16.

Listing #: 13-7811	Price: $342,000	Closest Town: Sterling

34460 Darnik Court
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res, B & B Potential
Baths: 2 **Style:** Two-Story
Garage/Carport: 4 / 0 **Year Built/Remodeled:** 1997

Did You Know?

You can limit your search results to listings added within the last day, two days, week or month. **Try an advanced search to see how!**

Square Feet: 2720 **Zoning:** UNZ
Lot Sq. Ft.: 162914 **Listing Office:** Five Star Realty, LLC
Acreage: 3.74

17.

Listing #: 13-7957	Price: $229,900	Closest Town: Sterling

38920 Moose River Drive
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 2 **Style:** Two-Story W/Basement
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1990
Square Feet: 1696 **Zoning:** UNK
Lot Sq. Ft.: 87120 **Listing Office:** RE/MAX of The Peninsula
Acreage: 2

18.

Listing #: 13-8792	Price: $269,000	Closest Town: Sterling

35341 Van Dyke Street
(VIEW DETAILS)
Beds: 4 **Type:** Single Family Res
Baths: 3 **Style:** Multi-Level
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1996
Square Feet: 2718 **Zoning:** UNZ
Lot Sq. Ft.: 178160 **Listing Office:** Redoubt Realty
Acreage: 4.09

19.

Listing #: 13-8976	Price: $123,000	Closest Town: Sterling

39385 Moose River Drive
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res, Recreational
Baths: 1 **Style:** Cabin, Log
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1992
Square Feet: 864 **Zoning:** UNK
Lot Sq. Ft.: 40075 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 0.92

20.

Listing #: 13-9441	Price: $169,000	Closest Town: Sterling

37007 Dutch Landing Loop
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Two-Story
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2011
Square Feet: 768 **Zoning:** UNZ
Lot Sq. Ft.: 98010 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 2.25

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Did You Know?

Competitive Market Analysis (CMA) – This is a tool that your real broker/licensee will produce for you when you are looking to list your home for sale to help establish the best price to offer and market your home. Because your real estate professional has access to all of the data in the AK MLS data base, including previously sold information, property history, sellers concessions and other critical information they will be able to interpret and produce a **CMA** specific to your home and help you determine its worth.

21.

Listing #: 13-9747	Price: $29,900	Closest Town: Sterling

35640 Ridgecrest Circle
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res
Baths: 1 **Style:**
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1970
Square Feet: 1416 **Zoning:** UNK
Lot Sq. Ft.: 79715 **Listing Office:** Jack White Real Estate
Acreage: 1.83

22.

Listing #: 13-10056	Price: $375,000	Closest Town: Sterling

New Construction

36308 Stephens Drive
(VIEW DETAILS)

Beds: 2 **Type:** Single Family Res, Recreational
Baths: 1 **Style:** Chalet/A-Frame
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1985
Square Feet: 1100 **Zoning:** UNK
Lot Sq. Ft.: 42012 **Listing Office:** Shel Hensley Real Estate Group
Acreage: 0.96

23.

Listing #: 13-10166	Price: $365,000	Closest Town: Sterling

37621 Dutch Landing Loop
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2007
Square Feet: 2169 **Zoning:** UNZ
Lot Sq. Ft.: 92783 **Listing Office:** Crane & Associates Realty
Acreage: 2.13

24.

Listing #: 13-10314	Price: $169,000	Closest Town: Sterling

38980 Grandview Drive
(VIEW DETAILS)

Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1996
Square Feet: 927 **Zoning:** UNZ
Lot Sq. Ft.: 40075 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.92

25.

Listing #: 13-10511	Price: $145,000	Closest Town: Sterling

39080 Grassy Vale Road
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Two-Story
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 2000
Square Feet: 1680 **Zoning:** UNZ
Lot Sq. Ft.: 74923 **Listing Office:** Redoubt Realty
Acreage: 1.72

Send feedback

26.

Listing #: 13-10520	Price: $43,000	Closest Town: Sterling

37300 Longview Street
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res
Baths: 1 **Style:** Chalet/A-Frame
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1982

Square Feet: 538 **Zoning:** RES
Lot Sq. Ft.: 324086 **Listing Office:** Soldotna Realty
Acreage: 7.44

27.

Listing #: 13-11308	Price: $117,500	Closest Town: Sterling

37693 Audrey Circle
(VIEW DETAILS)
Beds: 1 **Type:** Single Family Res
Baths: 1 **Style:** Other - See Remarks
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2007
Square Feet: 768 **Zoning:** UNZ
Lot Sq. Ft.: 12632 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.29

28.

Listing #: 13-11357	Price: $194,500	Closest Town: Sterling

L3 Upper Island
(VIEW DETAILS)
Beds: 1 **Type:** Recreational
Baths: 1 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1984
Square Feet: 777 **Zoning:** UNZ
Lot Sq. Ft.: 64469 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 1.48

29.

Listing #: 13-11842	Price: $219,000	Closest Town: Sterling

35535 Ridgecrest Circle
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res, Recreational
Baths: 1 **Style:** Cabin, Log, Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1975
Square Feet: 1024 **Zoning:** UNZ
Lot Sq. Ft.: 250906 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 5.76

30.

Listing #: 13-11941	Price: $92,400	Closest Town: Sterling

38630 Corey Street
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Ranch
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2000
Square Feet: 1056 **Zoning:** UNZ
Lot Sq. Ft.: 44867 **Listing Office:** Redoubt Realty
Acreage: 1.03

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Did You Know?

Contingency – You will hear the word contingency when entering into a contract sometimes. A common contingency would be that the offer to purchase the home is "contingent" on the home appraising for a certain dollar amount.

31.

Listing #: 13-12234	Price: $171,000	Closest Town: Sterling

37926 Sparrowson Avenue
(VIEW DETAILS)

Beds: 2 **Type:** Single Family Res
Baths: 1.5 **Style:** Ranch
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 1996 / 2013
Square Feet: 1040 **Zoning:** UNZ
Lot Sq. Ft.: 57499 **Listing Office:** Stenga Real Estate Group
Acreage: 1.32

32.

Listing #: 13-12754	Price: $79,900	Closest Town: Sterling

34230 Gene Autry Avenue
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res, Recreational
Baths: 0 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1980
Square Feet: 640 **Zoning:** UNZ
Lot Sq. Ft.: 59677 **Listing Office:** Redoubt Realty
Acreage: 1.37

33.

Listing #: 13-12916	Price: $165,000	Closest Town: Sterling

36285 Lakeview Street
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res
Baths: 1 **Style:** Other - See Remarks
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1998
Square Feet: 656 **Zoning:** UNK
Lot Sq. Ft.: 101930 **Listing Office:** Stenga Real Estate Group
Acreage: 2.34

34.

Listing #: 13-13409	Price: $240,000	Closest Town: Sterling

39070 Timbuktoo Street
(VIEW DETAILS)

Beds: 0 **Type:** Recreational
Baths: 0 **Style:** Other - See Remarks
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 2011
Square Feet: 0 **Zoning:** UNK
Lot Sq. Ft.: 2015086 **Listing Office:** Redoubt Realty
Acreage: 46.26

35.

Listing #: 13-13472	Price: $223,700	Closest Town: Sterling

36865 Scotsman Court
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Tri-Level
Garage/Carport: 0 / 1 **Year Built/Remodeled:** 1985 / 2013
Square Feet: 2016 **Zoning:** UNZ
Lot Sq. Ft.: 42253 **Listing Office:** Ron Moore Company
Acreage: 0.97

Send feedback

36.

Listing #: 13-13935	Price: $369,000	Closest Town: Sterling

39093 Forbidden Court
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 1.75 **Style:** Two-Story
Garage/Carport: 4 / 0 **Year Built/Remodeled:** 1967

Square Feet: 2646 **Zoning:** UNZ
Lot Sq. Ft.: 456509 **Listing Office:** Ron Moore Company
Acreage: 10.48

37.

Listing #: 13-14437	Price: $84,900	Closest Town: Sterling

30135 Wildlife Avenue
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 2 **Style:** Two-Story
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2003
Square Feet: 1152 **Zoning:** UNZ
Lot Sq. Ft.: 18731 **Listing Office:** Jack White Real Estate
Acreage: 0.43

38.

Listing #: 13-14603	Price: $165,000	Closest Town: Sterling

L2 Bear Road
(VIEW DETAILS)
Beds: 1 **Type:** Single Family Res
Baths: 1 **Style:** Ranch
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2013
Square Feet: 864 **Zoning:** UNZ
Lot Sq. Ft.: 208217 **Listing Office:** Century 21 Freedom Realty - Kenai
Acreage: 4.78

39.

Listing #: 13-14834	Price: $209,000	Closest Town: Sterling

34275 Silver Salmon Drive
(VIEW DETAILS)
Beds: 4 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 1997 / 2013
Square Feet: 1648 **Zoning:** UNZ
Lot Sq. Ft.: 68825 **Listing Office:** Alaska Premier Realty
Acreage: 1.58

40.

Listing #: 13-15230	Price: $199,000	Closest Town: Sterling

New Listing

37971 Elva Street
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2009
Square Feet: 1045 **Zoning:** UNZ
Lot Sq. Ft.: 37897 **Listing Office:** Century 21 Freedom Realty - Kenai
Acreage: 0.87

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Did You Know?

Offer – Offer refers to the amount that the interested home buyer "offers" to the seller for the purchase of a property offered for sale. The offer will be written up and formally by your licensee/broker and presented to the seller's licensee/broker for consideration.

Map Results | << Previous 10 | Next >>
41 - 43 of 43 | New Search | Modify Current Search

41.

Listing #: 13-15375	Price: $165,500	Closest Town: Sterling

New Listing

37875 Three Johns Street
(VIEW DETAILS)

Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Two-Story
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1998
Square Feet: 1144 **Zoning:** RES
Lot Sq. Ft.: 42253 **Listing Office:** Crane & Associates Realty
Acreage: 0.97

42.

Listing #: 13-15601	Price: $380,000	Closest Town: Sterling

New Listing

36498 Jimani Court
(VIEW DETAILS)

Beds: 4 **Type:** Single Family Res
Baths: 3 **Style:** Two-Story W/Basement
Garage/Carport: 2 / 1 **Year Built/Remodeled:** 1974
Square Feet: 2454 **Zoning:** UNZ
Lot Sq. Ft.: 78408 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 1.8

43.

Listing #: 13-15764	Price: $350,000	Closest Town: Sterling

New Listing

29780 Bing Drive
(VIEW DETAILS)

Beds: 4 **Type:** Single Family Res, B & B Potential
Baths: 4 **Style:** Cabin
Garage/Carport: 0 / 3 **Year Built/Remodeled:** 1988 / 1988
Square Feet: 1380 **Zoning:** UNZ
Lot Sq. Ft.: 114127 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 2.62

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41 - 43 of 43 | New Search | Modify Current Search

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Ascending Descending

Show 25 Results Per Page

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Map Results | << Previous | Next 25 >>
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1.

Listing #: 13-15976	Price: $129,000	Closest Town: Soldotna

New Listing

19165 Linda Lane
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1989
Square Feet: 1096 **Zoning:** UNZ
Lot Sq. Ft.: 121532 **Listing Office:** Alaska Real Estate Network And Alaskan Real Estate
Acreage: 2.79

2.

Listing #: 13-11545	Price: $135,000	Closest Town: Soldotna

45552 Spruce Avenue 317
(VIEW DETAILS)

Beds: 2 **Type:** Recreational
Baths: 1.5 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2006
Square Feet: 512 **Zoning:** UNZ
Lot Sq. Ft.: 1742 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.04

3.

Listing #: 12-14352	Price: $135,000	Closest Town: Soldotna

29365 Bluebell Lane
(VIEW DETAILS)

Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Two-Story
Garage/Carport: 0 / 2 **Year Built/Remodeled:** 1998
Square Feet: 1276 **Zoning:** UNZ
Lot Sq. Ft.: 40511 **Listing Office:** Crane & Associates Realty
Acreage: 0.93

4.

Listing #: 12-12484	Price: $135,000	Closest Town: Soldotna

34920 Fishermans Road
(VIEW DETAILS)

Beds: 0 **Type:** Recreational
Baths: 0 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1977
Square Feet: 560 **Zoning:** UNK
Lot Sq. Ft.: 44431 **Listing Office:** Redoubt Realty
Acreage: 1.02

5.

Listing #: 13-4339	Price: $140,000	Closest Town: Soldotna

347 Poachers Cove/aka 45552 Spruce Avenue
(VIEW DETAILS)

Beds: 2 **Type:** Recreational
Baths: 1 **Style:** Cabin
Garage/Carport: 0 / 1 **Year Built/Remodeled:** 2003
Square Feet: 500 **Zoning:** UNK
Lot Sq. Ft.: 1742 **Listing Office:** Stenga Real Estate Group
Acreage: 0.04

6.

Listing #: 13-12929	Price: $142,500	Closest Town: Soldotna

35697 Knackstedt Street
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1993

Did You Know?

Broker – The individual who runs a real estate company. In order to work as a broker in Alaska, an individual must have a certain level of experience, pass the state brokers exam, additionally brokers must take continual professional development education in order to maintain their broker's license and practice real estate in the state.

Square Feet: 1344 **Zoning:** RR
Lot Sq. Ft.: 40511 **Listing Office:** Five Star Realty, LLC
Acreage: 0.93

7.

Listing #: 13-2651	Price: $145,000	Closest Town: Soldotna

48948 Sirocco Drive #2
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Ranch
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 2007
Square Feet: 650 **Zoning:** UNZ
Lot Sq. Ft.: 42253 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 0.97

8.

Listing #: 13-2652	Price: $147,900	Closest Town: Soldotna

48930 Sirocco Drive #3
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Ranch
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2007
Square Feet: 904 **Zoning:** UNZ
Lot Sq. Ft.: 42253 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 0.97

9.

Listing #: 13-12001	Price: $150,000	Closest Town: Soldotna

48135 Estate Court
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 1991
Square Feet: 1344 **Zoning:** UNZ
Lot Sq. Ft.: 39640 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 0.91

10.

Listing #: 12-15846	Price: $150,000	Closest Town: Soldotna

32680 Salmon Run Drive
(VIEW DETAILS)
Beds: 4 **Type:** Single Family Res
Baths: 1.5 **Style:** Two-Story
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1999
Square Feet: 1536 **Zoning:** UNZ
Lot Sq. Ft.: 96268 **Listing Office:** Crane & Associates Realty
Acreage: 2.21

11.

Listing #: 13-13142	Price: $151,000	Closest Town: Soldotna

36065 Greenridge Street
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Ranch
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1997
Square Feet: 832 **Zoning:** RMKS
Lot Sq. Ft.: 10019 **Listing Office:** Crane & Associates Realty
Acreage: 0.23

12.

Listing #: 13-14694	Price: $152,000	Closest Town: Soldotna

274 W Katmai Avenue
(VIEW DETAILS)
Beds: 4 **Type:** Single Family Res
Baths: 2 **Style:** Split Entry, Tri-Level
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1983
Square Feet: 1520 **Zoning:** UNK
Lot Sq. Ft.: 10454 **Listing Office:** Redoubt Realty
Acreage: 0.24

13.

Listing #: 13-12813	Price: $160,000	Closest Town: Soldotna

30210 Missing Link Road
(VIEW DETAILS)

Beds: 2 **Type:** Single Family Res
Baths: 2 **Style:** Two-Story
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2005
Square Feet: 1200 **Zoning:** UNZ
Lot Sq. Ft.: 94525 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 2.17

14.

Listing #: 12-12161	Price: $162,500	Closest Town: Soldotna

48884 Jones Road
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res, Site Condo-Detached
Baths: 1 **Style:** Ranch
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 2008
Square Feet: 1092 **Zoning:** UNZ
Lot Sq. Ft.: 436 **Listing Office:** Century 21 Freedom Realty - Kenai
Acreage: 0.01

15.

Listing #: 13-3110	Price: $165,000	Closest Town: Soldotna

L200 Poachers Cove
(VIEW DETAILS)

Beds: 3 **Type:** Recreational
Baths: 2 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2005
Square Feet: 800 **Zoning:** UNZ
Lot Sq. Ft.: 1742 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.04

16.

Listing #: 13-9014	Price: $167,000	Closest Town: Soldotna

L41 Poacher's Loop
(VIEW DETAILS)

Beds: 1 **Type:** Recreational
Baths: 1 **Style:** Single Wide Mobile
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1983
Square Feet: 372 **Zoning:** UNZ
Lot Sq. Ft.: 1307 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.03

17.

Listing #: 12-7875	Price: $169,000	Closest Town: Soldotna

45552 Spruce Avenue #123
(VIEW DETAILS)

Beds: 3 **Type:** Recreational
Baths: 2 **Style:** Chalet/A-Frame
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2006
Square Feet: 1140 **Zoning:** RES
Lot Sq. Ft.: 2614 **Listing Office:** Stenga Real Estate Group
Acreage: 0.06

18.

Listing #: 13-10595	Price: $170,000	Closest Town: Soldotna

L347 L339 Poachers Cove/aka 45552 Spruce Avenue
(VIEW DETAILS)

Beds: 2 **Type:** Recreational
Baths: 1 **Style:** Cabin
Garage/Carport: 0 / 1 **Year Built/Remodeled:** 2003
Square Feet: 500 **Zoning:** UNZ
Lot Sq. Ft.: 3485 **Listing Office:** Stenga Real Estate Group
Acreage: 0.08

19.

Listing #: 13-14411	Price: $175,000	Closest Town: Soldotna

132 South Leibrock
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 1 **Style:** Ranch
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 1976
Square Feet: 952 **Zoning:** SF
Lot Sq. Ft.: 9148 **Listing Office:** Mossy Oak Properties of Alaska Kenai

Acreage: 0.21

20.

Listing #: 13-12387	Price: $175,000	Closest Town: Soldotna

48094 Autumn Court
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 1995
Square Feet: 1272 **Zoning:** UNZ
Lot Sq. Ft.: 43560 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 1

21.

Listing #: 12-2956	Price: $176,000	Closest Town: Soldotna

48815 Sterling Highway
(VIEW DETAILS)

Beds: 2 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2001
Square Feet: 1896 **Zoning:** UNZ
Lot Sq. Ft.: 348480 **Listing Office:** Soldotna Realty
Acreage: 8

22.

Listing #: 13-14796	Price: $179,000	Closest Town: Soldotna

344 W Rockwell Avenue
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Split Entry
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 1981
Square Feet: 1800 **Zoning:** SF
Lot Sq. Ft.: 11326 **Listing Office:** Redoubt Realty
Acreage: 0.26

23.

Listing #: 13-15528	Price: $179,900	Closest Town: Soldotna

New Listing

35935 Forerunner Street
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Split Entry
Garage/Carport: 0 / 1 **Year Built/Remodeled:** 1985
Square Feet: 2464 **Zoning:** UNZ
Lot Sq. Ft.: 13504 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.31

24.

Listing #: 13-11076	Price: $184,000	Closest Town: Soldotna

35563 Knackstedt Street
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1993
Square Feet: 1344 **Zoning:** UNZ
Lot Sq. Ft.: 40511 **Listing Office:** RE/MAX of The Peninsula
Acreage: 0.93

25.

Listing #: 13-12711	Price: $185,000	Closest Town: Soldotna

37546 Funny Moose Lane
(VIEW DETAILS)

Beds: 6 **Type:** Single Family Res, Recreational
Baths: 4.1 **Style:** Multi-Level
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2004
Square Feet: 2500 **Zoning:** UNZ
Lot Sq. Ft.: 40075 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.92

Map Results | << Previous | Next 25 >>
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list_price
Ascending Descending

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Did You Know?

Appraised Value – Appraised Value is the dollar value that the appraiser determines that a property is valued at given its condition, size, location and other factors. This is the number your lender will likely use when determining how much they will lend for a given property.

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26.

Listing #: 13-10675	Price: $185,000	Closest Town: Soldotna

33568 Harvey Street
(VIEW DETAILS)

Beds: 3 | **Type:** Single Family Res
Baths: 1.5 | **Style:** Two-Story
Garage/Carport: 2 / 0 | **Year Built/Remodeled:** 1985
Square Feet: 1640 | **Zoning:** UNZ
Lot Sq. Ft.: 42689 | **Listing Office:** Crane & Associates Realty
Acreage: 0.98

27.

Listing #: 13-11887	Price: $186,000	Closest Town: Soldotna

34345 Matanuska Street
(VIEW DETAILS)

Beds: 2 | **Type:** Single Family Res
Baths: 2 | **Style:** Ranch
Garage/Carport: 0 / 0 | **Year Built/Remodeled:** 2010
Square Feet: 1115 | **Zoning:** UNK
Lot Sq. Ft.: 40075 | **Listing Office:** RE/MAX of The Peninsula
Acreage: 0.92

28.

Listing #: 13-15568	Price: $187,000	Closest Town: Soldotna

New Listing

35600 Fern Forest Street
(VIEW DETAILS)

Beds: 3 | **Type:** Single Family Res
Baths: 2 | **Style:** Ranch
Garage/Carport: 0 / 0 | **Year Built/Remodeled:** 1993
Square Feet: 1644 | **Zoning:** UNZ
Lot Sq. Ft.: 40511 | **Listing Office:** RE/MAX of The Peninsula
Acreage: 0.93

29.

Listing #: 13-11553	Price: $188,000	Closest Town: Soldotna

33920 Echo Lake Road
(VIEW DETAILS)

Beds: 4 | **Type:** Single Family Res
Baths: 2.5 | **Style:** Ranch
Garage/Carport: 3 / 0 | **Year Built/Remodeled:** 1975
Square Feet: 2181 | **Zoning:** UNZ
Lot Sq. Ft.: 46174 | **Listing Office:** Five Star Realty, LLC
Acreage: 1.06

30.

Listing #: 13-11111	Price: $189,000	Closest Town: Soldotna

47395 Virgo Court
(VIEW DETAILS)

Beds: 3 | **Type:** Single Family Res
Baths: 2 | **Style:** Ranch
Garage/Carport: 1 / 0 | **Year Built/Remodeled:** 1998
Square Feet: 1104 | **Zoning:** UNZ
Lot Sq. Ft.: 24394 | **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.56

Send feedback

31.

Listing #: 13-15784	Price: $189,900	Closest Town: Soldotna

149 Robin Place
(VIEW DETAILS)

Beds: 3 | **Type:** Single Family Res
Baths: 2 | **Style:** Ranch
Garage/Carport: 0 / 0 | **Year Built/Remodeled:** 1963

New Listing

Square Feet: 2016
Lot Sq. Ft.: 12197
Acreage: 0.28
Zoning: C
Listing Office: Five Star Realty, LLC

32.

Listing #: 13-12651	Price: $189,900	Closest Town: Soldotna

35106 Huntington Drive
(VIEW DETAILS)
Beds: 3
Baths: 2
Garage/Carport: 2 / 0
Square Feet: 1352
Lot Sq. Ft.: 20038
Acreage: 0.46
Type: Single Family Res
Style: Ranch
Year Built/Remodeled: 1998 / 2012
Zoning: UNZ
Listing Office: Chris Druesedow Real Estate Team Branch Keller Williams Group

33.

Listing #: 13-9131	Price: $189,900	Closest Town: Soldotna

34176 Matanuska Street #13
(VIEW DETAILS)
Beds: 2
Baths: 1
Garage/Carport: 3 / 0
Square Feet: 904
Lot Sq. Ft.: 14215
Acreage: 0.33
Type: Single Family Res
Style: Ranch
Year Built/Remodeled: 2007
Zoning: UNZ
Listing Office: Century 21 Freedom Realty - Soldotna

34.

Listing #: 13-2126	Price: $192,500	Closest Town: Soldotna

34797 Libra Court
(VIEW DETAILS)
Beds: 3
Baths: 2
Garage/Carport: 2 / 0
Square Feet: 1151
Lot Sq. Ft.: 20038
Acreage: 0.46
Type: Single Family Res
Style: Ranch
Year Built/Remodeled: 1997 / 2007
Zoning: UNZ
Listing Office: Century 21 Freedom Realty - Soldotna

35.

Listing #: 13-12643	Price: $194,900	Closest Town: Soldotna

36608 Pine Street
(VIEW DETAILS)
Beds: 3
Baths: 1.75
Garage/Carport: 1 / 0
Square Feet: 1344
Lot Sq. Ft.: 44867
Acreage: 1.03
Type: Single Family Res
Style: Ranch
Year Built/Remodeled: 2005
Zoning: UNZ
Listing Office: Century 21 Freedom Realty - Soldotna

36.

Listing #: 13-15290	Price: $199,000	Closest Town: Soldotna

New Listing

30573 Lure Court
(VIEW DETAILS)
Beds: 2
Baths: 1
Garage/Carport: 0 / 0
Square Feet: 1760
Lot Sq. Ft.: 28750
Acreage: 0.66
Type: Single Family Res
Style: Cabin, Log
Year Built/Remodeled: 1977
Zoning: UNZ
Listing Office: Soldotna Realty

37.

Listing #: 13-11471	Price: $199,500	Closest Town: Soldotna

32652 Leslie Circle
(VIEW DETAILS)
Beds: 3
Baths: 2
Garage/Carport: 0 / 0
Square Feet: 1696
Lot Sq. Ft.: 43996
Acreage: 1.01
Type: Single Family Res
Style: Two-Story
Year Built/Remodeled: 1990
Zoning: UNZ
Listing Office: RE/MAX of The Peninsula

38.

Listing #: 13-14593	Price: $199,900	Closest Town: Soldotna
	**34669 Commerce Street** (VIEW DETAILS) **Beds:** 3 **Baths:** 2 **Garage/Carport:** 2 / 0 **Square Feet:** 1312 **Lot Sq. Ft.:** 20038 **Acreage:** 0.46	**Type:** Single Family Res **Style:** Ranch **Year Built/Remodeled:** 1997 **Zoning:** UNZ **Listing Office:** Century 21 Freedom Realty - Soldotna

39.

Listing #: 13-11113	Price: $200,000	Closest Town: Soldotna
	**34583 Funny River Road** (VIEW DETAILS) **Beds:** 4 **Baths:** 3 **Garage/Carport:** 0 / 0 **Square Feet:** 2400 **Lot Sq. Ft.:** 41818 **Acreage:** 0.96	**Type:** Single Family Res **Style:** Multi-Level **Year Built/Remodeled:** 1983 / 2011 **Zoning:** UNZ **Listing Office:** Century 21 Freedom Realty - Soldotna

40.

Listing #: 13-14867	Price: $204,900	Closest Town: Soldotna
	**35308 Iditarod Street** (VIEW DETAILS) **Beds:** 3 **Baths:** 1 **Garage/Carport:** 1 / 0 **Square Feet:** 1013 **Lot Sq. Ft.:** 40075 **Acreage:** 0.92	**Type:** Single Family Res **Style:** Ranch **Year Built/Remodeled:** 2001 **Zoning:** UNK **Listing Office:** Five Star Realty, LLC

41.

Listing #: 11-14424	Price: $209,900	Closest Town: Soldotna
	**335 W Marydale Avenue** (VIEW DETAILS) **Beds:** 3 **Baths:** 2 **Garage/Carport:** 2 / 0 **Square Feet:** 1352 **Lot Sq. Ft.:** 10890 **Acreage:** 0.25	**Type:** Single Family Res **Style:** Ranch **Year Built/Remodeled:** 2003 **Zoning:** RR **Listing Office:** Alaska 1st Realty, Inc.

42.

Listing #: 13-15877	Price: $210,000	Closest Town: Soldotna
 New Listing	**42150 Salamatof Drive** (VIEW DETAILS) **Beds:** 5 **Baths:** 2.5 **Garage/Carport:** 0 / 0 **Square Feet:** 2160 **Lot Sq. Ft.:** 42253 **Acreage:** 0.97	**Type:** Single Family Res **Style:** Multi-Level **Year Built/Remodeled:** 2007 / 2010 **Zoning:** UNZ **Listing Office:** Crane & Associates Realty

43.

Listing #: 13-8997	Price: $210,000	Closest Town: Soldotna
	**35890 Poppy Ridge Road** (VIEW DETAILS) **Beds:** 3 **Baths:** 2 **Garage/Carport:** 2 / 0 **Square Feet:** 1352 **Lot Sq. Ft.:** 40511 **Acreage:** 0.93	**Type:** Single Family Res **Style:** Ranch **Year Built/Remodeled:** 2004 **Zoning:** UNZ **Listing Office:** Century 21 Freedom Realty - Kenai

44.

Listing #: 11-14317	Price: $210,000	Closest Town: Soldotna
	**30470 Arc Loop Road** (VIEW DETAILS) **Beds:** 3 **Baths:** 2 **Garage/Carport:** 0 / 0 **Square Feet:** 1664 **Lot Sq. Ft.:** 225641	**Type:** Single Family Res, B & B Potential **Style:** Ranch **Year Built/Remodeled:** 1992 **Zoning:** UNK **Listing Office:** Redoubt Realty

Acreage: 5.18

45.

Listing #: 13-15143	Price: $223,700	Closest Town: Soldotna

430 Chugach Drive
(VIEW DETAILS)

Beds: 3 | **Type:** Single Family Res
Baths: 2 | **Style:** Hillside Ranch/Daylight Basement
Garage/Carport: 1 / 0 | **Year Built/Remodeled:** 1980 / 2010
Square Feet: 2370 | **Zoning:** RR
Lot Sq. Ft.: 72310 | **Listing Office:** Century 21 Freedom Realty - Kenai
Acreage: 1.66

46.

Listing #: 12-14543	Price: $224,900	Closest Town: Soldotna

38410 Salmon Circle
(VIEW DETAILS)

Beds: 3 | **Type:** Single Family Res, Recreational, B & B Potential
Baths: 3 | **Style:** Cabin, Log
Garage/Carport: 1 / 0 | **Year Built/Remodeled:** 2002
Square Feet: 1352 | **Zoning:** UNZ
Lot Sq. Ft.: 81022 | **Listing Office:** Ron Moore Company
Acreage: 1.86

47.

Listing #: 13-15940	Price: $225,000	Closest Town: Soldotna

New Listing

47025 Tagala Avenue
(VIEW DETAILS)

Beds: 3 | **Type:** Single Family Res
Baths: 2 | **Style:** Hillside Ranch/Daylight Basement
Garage/Carport: 1 / 1 | **Year Built/Remodeled:** 1979 / 2003
Square Feet: 1570 | **Zoning:** RR
Lot Sq. Ft.: 36154 | **Listing Office:** Ron Moore Company
Acreage: 0.83

48.

Listing #: 13-15753	Price: $225,000	Closest Town: Soldotna

New Listing

183 N Kobuk Street
(VIEW DETAILS)

Beds: 4 | **Type:** Single Family Res
Baths: 2 | **Style:** Split Entry
Garage/Carport: 1 / 0 | **Year Built/Remodeled:** 1981 / 1995
Square Feet: 1888 | **Zoning:** RR
Lot Sq. Ft.: 11326 | **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.26

49.

Listing #: 13-13199	Price: $225,000	Closest Town: Soldotna

42373 National Avenue
(VIEW DETAILS)

Beds: 3 | **Type:** Single Family Res
Baths: 2 | **Style:** Two-Story
Garage/Carport: 2 / 0 | **Year Built/Remodeled:** 1984
Square Feet: 2120 | **Zoning:** RES
Lot Sq. Ft.: 45738 | **Listing Office:** Five Star Realty, LLC
Acreage: 1.05

50.

Listing #: 13-8298	Price: $225,000	Closest Town: Soldotna

33640 Browns Lake Road
(VIEW DETAILS)

Beds: 2 | **Type:** Single Family Res
Baths: 1 | **Style:** Two-Story
Garage/Carport: 0 / 0 | **Year Built/Remodeled:** 1983 / 2007
Square Feet: 1752 | **Zoning:** UNZ
Lot Sq. Ft.: 270072 | **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 6.2

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⊙ Ascending ○ Descending

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51.

Listing #: 13-7635	Price: $225,000	Closest Town: Soldotna

45552 Spruce Avenue L336
(VIEW DETAILS)
Beds: 3 **Type:** Recreational
Baths: 2 **Style:** Cabin
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 2007
Square Feet: 918 **Zoning:** UNZ
Lot Sq. Ft.: 1742 **Listing Office:** Redoubt Realty
Acreage: 0.04

52.

Listing #: 13-7571	Price: $225,000	Closest Town: Soldotna

41730 Padfoot Avenue
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 2 **Style:**
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2007
Square Feet: 1568 **Zoning:** UNK
Lot Sq. Ft.: 43560 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 1

53.

Listing #: 13-5264	Price: $228,000	Closest Town: Soldotna

New Construction

35397 Iditarod Street
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2013
Square Feet: 1260 **Zoning:** UNZ
Lot Sq. Ft.: 53579 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 1.23

54.

Listing #: 13-13080	Price: $229,900	Closest Town: Soldotna

248 W Katmai Avenue
(VIEW DETAILS)
Beds: 5 **Type:** Single Family Res
Baths: 2 **Style:** Two-Story
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 1983 / 2009
Square Feet: 2016 **Zoning:** SF
Lot Sq. Ft.: 10454 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.24

55.

Listing #: 13-14340	Price: $235,000	Closest Town: Soldotna

33617 Community College Drive
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 1 / 0 **Year Built/Remodeled:** 2011
Square Feet: 1196 **Zoning:** UNK
Lot Sq. Ft.: 40075 **Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
Acreage: 0.92

Send feedback

56.

Listing #: 13-12887	Price: $235,000	Closest Town: Soldotna

46660 Gary Avenue
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Cabin, Log, Ranch
Garage/Carport: 3 / 0 **Year Built/Remodeled:** 2004

Did You Know?

Interest – Refers to the fees charged by your lender to loan you the money to purchase your home.

Square Feet: 1040
Lot Sq. Ft.: 55321
Acreage: 1.27
Zoning: UNZ
Listing Office: Century 21 Freedom Realty - Soldotna

57.

Listing #: 13-14118	Price: $236,000	Closest Town: Soldotna

30624 Boulder Court
(VIEW DETAILS)
Beds: 2
Baths: 2
Garage/Carport: 1 / 0
Square Feet: 1338
Lot Sq. Ft.: 81893
Acreage: 1.88
Type: Single Family Res
Style: Ranch
Year Built/Remodeled: 2009 / 2013
Zoning: UNK
Listing Office: RE/MAX of Homer

58.

Listing #: 13-14469	Price: $240,000	Closest Town: Soldotna

286 Arlington Court
(VIEW DETAILS)
Beds: 4
Baths: 2
Garage/Carport: 1 / 0
Square Feet: 2088
Lot Sq. Ft.: 10890
Acreage: 0.25
Type: Single Family Res
Style: Split Entry
Year Built/Remodeled: 1995
Zoning: UNK
Listing Office: Alaska 1st Realty, Inc.

59.

Listing #: 13-10903	Price: $240,000	Closest Town: Soldotna

49175 Shadura Road
(VIEW DETAILS)
Beds: 3
Baths: 2
Garage/Carport: 0 / 2
Square Feet: 2240
Lot Sq. Ft.: 47480
Acreage: 1.09
Type: Single Family Res
Style: Multi-Level, Two-Story W/Basement
Year Built/Remodeled: 2008
Zoning: UNZ
Listing Office: Chris Druesedow Real Estate Team Branch Keller Williams Group

60.

Listing #: 13-15242	Price: $245,000	Closest Town: Soldotna

New Listing

153 Hillcrest Avenue
(VIEW DETAILS)
Beds: 4
Baths: 2
Garage/Carport: 2 / 0
Square Feet: 2328
Lot Sq. Ft.: 12632
Acreage: 0.29
Type: Single Family Res
Style: Two-Story
Year Built/Remodeled: 1968
Zoning: SF
Listing Office: Redoubt Realty

61.

Listing #: 13-13446	Price: $247,000	Closest Town: Soldotna

34010 Gas Well Road
(VIEW DETAILS)
Beds: 5
Baths: 2
Garage/Carport: 0 / 0
Square Feet: 3360
Lot Sq. Ft.: 164221
Acreage: 3.77
Type: Single Family Res
Style: Raised Ranch
Year Built/Remodeled: 1967
Zoning: UNZ
Listing Office: Century 21 Freedom Realty - Soldotna

62.

Listing #: 13-13312	Price: $247,000	Closest Town: Soldotna

33205 Rensselaer Lane
(VIEW DETAILS)
Beds: 3
Baths: 2
Garage/Carport: 2 / 0
Square Feet: 1392
Lot Sq. Ft.: 40946
Acreage: 0.94
Type: Single Family Res
Style: Two-Story
Year Built/Remodeled: 1982 / 2012
Zoning: UNZ
Listing Office: Century 21 Freedom Realty - Soldotna

63.

Listing #: 13-16120	Price: $249,000	Closest Town: Soldotna
 New Listing	**48325 Alpha Drive** (VIEW DETAILS)	
	Beds: 4	**Type:** Single Family Res
	Baths: 2.75	**Style:** Two-Story
	Garage/Carport: 0 / 0	**Year Built/Remodeled:** 1978
	Square Feet: 2856	**Zoning:** UNZ
	Lot Sq. Ft.: 435600	**Listing Office:** Century 21 Freedom Realty - Soldotna
	Acreage: 10	

64.

Listing #: 13-10215	Price: $259,000	Closest Town: Soldotna
 New Construction	**47935 Snipe Avenue** (VIEW DETAILS)	
	Beds: 4	**Type:** Single Family Res
	Baths: 2.5	**Style:** Two-Story
	Garage/Carport: 1 / 0	**Year Built/Remodeled:** 2012
	Square Feet: 1804	**Zoning:** UNZ
	Lot Sq. Ft.: 30492	**Listing Office:** Stenga Real Estate Group
	Acreage: 0.7	

65.

Listing #: 13-14280	Price: $260,000	Closest Town: Soldotna
	**38625 Homewood Avenue** (VIEW DETAILS)	
	Beds: 3	**Type:** Single Family Res
	Baths: 2	**Style:** Ranch
	Garage/Carport: 0 / 0	**Year Built/Remodeled:** 2013
	Square Feet: 1800	**Zoning:** UNK
	Lot Sq. Ft.: 87120	**Listing Office:** Chris Druesedow Real Estate Team Branch Keller Williams Group
	Acreage: 2	

66.

Listing #: 13-9784	Price: $261,500	Closest Town: Soldotna
	**36718 St. Theresa Road** (VIEW DETAILS)	
	Beds: 3	**Type:** Single Family Res
	Baths: 2	**Style:** Ranch
	Garage/Carport: 2 / 0	**Year Built/Remodeled:** 2006
	Square Feet: 1760	**Zoning:** UNK
	Lot Sq. Ft.: 45738	**Listing Office:** Ron Moore Company
	Acreage: 1.05	

67.

Listing #: 13-15668	Price: $265,000	Closest Town: Soldotna
 New Listing	**104 N Kobuk Street** (VIEW DETAILS)	
	Beds: 4	**Type:** Single Family Res
	Baths: 2.5	**Style:** Two-Story
	Garage/Carport: 2 / 0	**Year Built/Remodeled:** 1976 / 2013
	Square Feet: 2616	**Zoning:** SF
	Lot Sq. Ft.: 10454	**Listing Office:** Soldotna Realty
	Acreage: 0.24	

68.

Listing #: 11-11419	Price: $265,000	Closest Town: Soldotna
	**37270 Ansel Drive** (VIEW DETAILS)	
	Beds: 1	**Type:** Single Family Res
	Baths: 1	**Style:** Two-Story W/Basement
	Garage/Carport: 0 / 0	**Year Built/Remodeled:** 1995
	Square Feet: 1129	**Zoning:** UNZ
	Lot Sq. Ft.: 42689	**Listing Office:** Soldotna Realty
	Acreage: 0.98	

69.

Listing #: 13-15567	Price: $269,000	Closest Town: Soldotna
 New Listing	**30150 Stubblefield Drive** (VIEW DETAILS)	
	Beds: 3	**Type:** Single Family Res
	Baths: 2	**Style:** Ranch
	Garage/Carport: 2 / 0	**Year Built/Remodeled:** 2005
	Square Feet: 1572	**Zoning:** UNZ
	Lot Sq. Ft.: 69260	**Listing Office:** Five Star Realty, LLC

Acreage: 1.59

70.

Listing #: 13-15083	Price: $269,000	Closest Town: Soldotna

360 W Katmai Avenue
(VIEW DETAILS)

Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2001
Square Feet: 1771 **Zoning:** SF/TF
Lot Sq. Ft.: 10890 **Listing Office:** Crane & Associates Realty
Acreage: 0.25

71.

Listing #: 13-740	Price: $269,400	Closest Town: Soldotna

37960 Rainbow Drive
(VIEW DETAILS)

Beds: 1 **Type:** Single Family Res
Baths: 1 **Style:**
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1968
Square Feet: 1600 **Zoning:** UNK
Lot Sq. Ft.: 55757 **Listing Office:** Five Star Realty, LLC
Acreage: 1.28

72.

Listing #: 13-13155	Price: $270,000	Closest Town: Soldotna

45580 Spruce Avenue
(VIEW DETAILS)

Beds: 2 **Type:** Recreational, Manufactured
Baths: 2 **Style:** Chalet/A-Frame, Single Wide Mobile
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2001
Square Feet: 800 **Zoning:** RES
Lot Sq. Ft.: 3484 **Listing Office:** Stenga Real Estate Group
Acreage: 0.08

73.

Listing #: 13-14135	Price: $275,000	Closest Town: Soldotna

33395 Community College Drive
(VIEW DETAILS)

Beds: 4 **Type:** Single Family Res
Baths: 3.5 **Style:**
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1977
Square Feet: 2962 **Zoning:** UNZ
Lot Sq. Ft.: 40075 **Listing Office:** Redoubt Realty
Acreage: 0.92

74.

Listing #: 12-6425	Price: $275,000	Closest Town: Soldotna

35672 Fishermans Court
(VIEW DETAILS)

Beds: 2 **Type:** Single Family Res, Recreational
Baths: 1 **Style:** Cabin, Chalet/A-Frame
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1983
Square Feet: 1432 **Zoning:** UNZ
Lot Sq. Ft.: 38768 **Listing Office:** Five Star Realty, LLC
Acreage: 0.89

75.

Listing #: 13-10743	Price: $285,000	Closest Town: Soldotna

45552 Spruce Avenue #108 & #109
(VIEW DETAILS)

Beds: 0 **Type:** Recreational
Baths: 0 **Style:** Cabin
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 2003
Square Feet: 546 **Zoning:** UNK
Lot Sq. Ft.: 1307 **Listing Office:** Redoubt Realty
Acreage: 0.03

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76.

Listing #: 13-2536	Price: $299,000	Closest Town: Soldotna

35735 Fishermans Court
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res
Baths: 2 **Style:** Ranch
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 2003
Square Feet: 1664 **Zoning:** UNZ
Lot Sq. Ft.: 51401 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 1.18

77.

Listing #: 12-12410	Price: $320,000	Closest Town: Soldotna

34950 Kustatan Street
(VIEW DETAILS)
Beds: 4 **Type:** Single Family Res
Baths: 3.5 **Style:** Two-Story W/Basement
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1988
Square Feet: 3960 **Zoning:** UNK
Lot Sq. Ft.: 130680 **Listing Office:** Soldotna Realty
Acreage: 3

78.

Listing #: 13-9435	Price: $325,000	Closest Town: Soldotna

264 River Watch Drive
(VIEW DETAILS)
Beds: 4 **Type:** Single Family Res
Baths: 2.5 **Style:** Two-Story
Garage/Carport: 2 / 0 **Year Built/Remodeled:** 1993 / 1999
Square Feet: 2609 **Zoning:** SF/TF
Lot Sq. Ft.: 20038 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 0.46

79.

Listing #: 13-9110	Price: $325,000	Closest Town: Soldotna

36154 King Salmon Avenue
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Cabin
Garage/Carport: 0 / 1 **Year Built/Remodeled:** 1999
Square Feet: 660 **Zoning:** UNZ
Lot Sq. Ft.: 59242 **Listing Office:** Soldotna Realty
Acreage: 1.36

80.

Listing #: 13-9147	Price: $339,000	Closest Town: Soldotna

35694 King Salmon Avenue
(VIEW DETAILS)
Beds: 1 **Type:** Single Family Res
Baths: 1 **Style:** Other - See Remarks
Garage/Carport: 1 / 1 **Year Built/Remodeled:** 1995
Square Feet: 720 **Zoning:** UNZ
Lot Sq. Ft.: 59677 **Listing Office:** Century 21 Freedom Realty - Soldotna
Acreage: 1.37

81.

Listing #: 13-6849	Price: $342,500	Closest Town: Soldotna

48675 Runners Avenue
(VIEW DETAILS)
Beds: 4 **Type:** Single Family Res
Baths: 2.5 **Style:** Two-Story
Garage/Carport: 3 / 0 **Year Built/Remodeled:** 2006

Did You Know?

As-Is – "As-Is" means that the seller is offering the home in its current condition and has generally stated that any defects known or un-known to them will not be fixed as a condition of the sale.

Square Feet: 2428 **Zoning:** UNZ
Lot Sq. Ft.: 42253 **Listing Office:** Crane & Associates Realty
Acreage: 0.97

82.

Listing #: 13-4798	Price: $347,500	Closest Town: Soldotna

37108 Funny River Road
(VIEW DETAILS)
Beds: 2 **Type:** Single Family Res
Baths: 1 **Style:** Two-Story
Garage/Carport: 0 / 0 **Year Built/Remodeled:** 1994
Square Feet: 1920 **Zoning:** UNZ
Lot Sq. Ft.: 40075 **Listing Office:** Soldotna Realty
Acreage: 0.92

83.

Listing #: 13-13888	Price: $349,900	Closest Town: Soldotna

44335 Domina Avenue
(VIEW DETAILS)
Beds: 4 **Type:** Single Family Res, Recreational, B & B in Operation, B & B Potential
Baths: 3 **Style:** Two-Story
Garage/Carport: 2 / 1 **Year Built/Remodeled:** 1958 / 2009
Square Feet: 2912 **Zoning:** UNZ
Lot Sq. Ft.: 77537 **Listing Office:** Mossy Oak Properties of Alaska Kenai
Acreage: 1.78

84.

Listing #: 13-9681	Price: $349,900	Closest Town: Soldotna

34954 Fishermens Road
(VIEW DETAILS)
Beds: 3 **Type:** Single Family Res, Recreational, B & B Potential
Baths: 2 **Style:** Cabin, Log, Ranch, Other - See Remarks
Garage/Carport: 2 / 1 **Year Built/Remodeled:** 2002
Square Feet: 1538 **Zoning:** UNZ
Lot Sq. Ft.: 54886 **Listing Office:** Redoubt Realty
Acreage: 1.26

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Listing content updated 11/18/2013 11:37 AM

Appendix C
ANILCA Section 810 Subsistence Evaluation

Prepared for:

State of Alaska
Department of Transportation and
Public Facilities

Prepared by:
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February 2014

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Abbreviations and Acronyms

ADF&G	Alaska Department of Fish and Game
ANCSA	Alaska Native Claims Settlement Act
ANILCA	Alaska National Interest Lands Conservation Act
CIRI	Cook Inlet Region, Incorporated
CNF	Chugach National Forest
CSIS	Community Subsistence Information System
DOT&PF	Alaska Department of Transportation and Public Facilities
FHWA	Federal Highway Administration
FSB	Federal Subsistence Board
GMU	Game Management Unit
KNWR	Kenai National Wildlife Refuge
KWAP	Kenai Winter Access Plan
SEIS	Supplemental Environmental Impact Statement
USFS	U.S. Forest Service

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1 Introduction

The Alaska Department of Transportation and Public Facilities (DOT&PF) has identified the need to upgrade and expand the Sterling Highway in the Cooper Landing area (milepost [MP] 45 to 60) to meet current design standards for rural principal arterial roads. The Sterling Highway traverses through the Kenai River valley between rugged mountainous areas. The highway provides access to the Kenai River, one of the most popular recreation destinations in Alaska. Between MP 45 and 60, the road passes through portions of the Chugach National Forest (CNF) and the Kenai National Wildlife Refuge (KNWR). These are federal lands that provide subsistence opportunities to qualified rural[1] Alaska residents under the provisions of the Alaska National Interest Lands Conservation Act (ANILCA).

Section 810 of ANILCA (16 USC Section 3120) requires an evaluation of the effects on subsistence uses of federal lands. This report was prepared to comply with Title VIII, Section 810, of ANILCA. It evaluates the potential restrictions to subsistence uses and needs on federal lands that could result from implementation of the reasonable alternatives[2] for the Sterling Highway MP 45-60 project.

Federal Highway Administration (FHWA) submitted an earlier draft of this evaluation to the U.S. Fish and Wildlife Service (USFWS) and the U.S. Forest Service (USFS) for comment and review in early 2007, revised per agency comments, and resubmitted the report in December 2007. This current report refreshes the previous evaluation with updated study and community data.

2 Subsistence Evaluation Factors

ANILCA (Section 803) defines subsistence uses as the "customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicrafts articles out of non-edible byproducts of fish and wildlife resources taken for family or personal consumption; for barter, or sharing for personal or family consumption; and for customary trade."

An evaluation of potential subsistence impacts under ANILCA Section 810 must be completed for the proposed Sterling Highway MP 45-60 Project because the project area encompasses federal lands managed by the USFWS and USFS. FHWA proposes to provide funding to use public lands for highway purposes, and the USFS and USFWS would need to transfer an interest in federal public land to the State for highway purposes.

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[1] As defined in ANILCA, "rural" residents live in a community or area that is "substantially dependent on fish and wildlife for nutritional and other subsistence uses." State subsistence regulations do not include this restriction to rural residents.

[2] The impacts were carefully weighed and the alternatives were evaluated for "reasonableness." NEPA considers reasonable those alternatives that are practical or feasible from a technical and economic standpoint and using common sense (Council on Environmental Quality: 40 Most Asked Questions Concerning CEQ's NEPA Regulations; 46 Fed. Reg. 18026, as amended, 51 Fed. Reg. 15618). Thus, reasonable means those alternatives that, when considered relative to each of the evaluations criteria, are worthy of future evaluation for this project. Reasonable does not mean to imply that any one alternative is more preferable than any other. That determination will be made in the Supplemental Environmental Impact Statement (SEIS). For a detailed description of all project alternatives, refer to the Sterling Highway, Milepost 45-60, SEIS, Chapter 2, Project Alternatives.

Title VIII of ANILCA (Section 810(a)) requires that an evaluation of subsistence uses and needs be completed as part of any Federal agency determination to "withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands." Specifically, ANILCA 810(a) requires an evaluation based on three specific issues:

1. The effect of use, occupancy or disposition on subsistence uses and needs;
2. The availability of other lands for the purpose sought to be achieved; and
3. Other alternatives that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes (16 USC § 3120).

The harvest of subsistence resources by Alaska Native cultures has been an essential way of life for thousands of years and has also become critical to the lives of many non-Natives, particularly rural Alaskans. According to the Alaska Department of Fish and Game (ADF&G), Alaska's rural residents harvested approximately 38 million pounds of fish and wildlife resources each year, with an average of 316 pounds per person in 2010 (ADF&G 2010). Based on ADF&G Division of Subsistence research, fish generally comprise more than 60 percent of the subsistence harvest, but account for only 2 percent of all fish caught in Alaska. Commercial fisheries in Alaska account for 97 percent and sport fishing accounts for about 1 percent of fish.

Federal law defines rural and non-rural areas for purposes of subsistence access and management. Federal subsistence regulations apply to harvests on Federally-owned lands by communities designated as rural. The Federal Subsistence Board (FSB) is charged with determining rural status for communities that have customarily and traditionally harvested particular subsistence resources. The FSB has identified three non-rural areas on the Kenai Peninsula: the Homer Non-rural Area (including Homer, Anchor Point [portion], Kachemak City, and Fritz Creek [portion]); the Kenai Non-rural Area (including Clam Gulch, Kalifornsky, Kasilof, Kenai, Nikiski, Salamatof, Soldotna, and Sterling); and the Seward Non-rural Area (including Seward and Moose Pass). The FSB has granted rural designation to the communities of Cooper Landing, Hope, and Ninilchik (see Map 1).

The FSB has established season and bag limits, as well as methods and means for salmon and resident fish in the upper Kenai River for the residents of Hope and Cooper Landing and for salmon for the residents for Ninilchik. The FSB has adopted regulations that recognize the customary and traditional use[3] of moose by residents of Cooper Landing in Game Management Units (GMUs) 7, 15A, and 15B. FSB recognition of the customary and traditional use of moose and black bear by residents of Ninilchik in GMUs 15A and 15B is first noted in subsistence management regulations in 2008; however, subsistence moose harvests by Ninilchik residents in GMU 15 predates this. The FSB has adopted regulations recognizing the customary and traditional use of moose and caribou by residents of Hope in GMU 7. Table 2-1 summarizes some of the key historical subsistence points for the Kenai Peninsula.

[3] As defined in ANILCA, "'customary and traditional uses' means the noncommercial, long-term, and consistent taking of, use of, or reliance upon fish and wildlife in a specific area and the patterns and practices of taking or use of that fish and wildlife that have been established over a reasonable period of time, taking into consideration the availability of the fish and wildlife."

Table 2-1: Kenai Peninsula subsistence key points

Year	Key Subsistence Point
1952	All Kenai Peninsula lakes and streams are closed to subsistence fishing.
1960	Federal government transfers the authority to manage fish and wildlife in Alaska to the State government.
1971	Congress passes the Alaska Native Claims Settlement Act (ANCSA), which conveys to Alaska Natives title to land and monetary compensation but extinguishes aboriginal hunting and fishing rights.
1978	State subsistence law creates a priority for subsistence use over all other uses, but does not define subsistence users.
1980	Congress passes the ANILCA. Title VIII of ANILCA protects subsistence needs for rural Alaskans.
1990	Federal subsistence program begins management of subsistence harvest of wildlife by rural residents of Federal public lands on the Kenai Peninsula.
1999	Federal government assumes management of subsistence fishing on navigable waters.
2001	FSB defers action on proposals to change Kenai Peninsula subsistence fishery regulations pending completion of a study of local subsistence uses. Board adopts subsistence fishing regulations mirroring state sport fishing regulations as a temporary measure until new subsistence regulations are developed for the Kenai Peninsula.
January 2006	FSB makes initial Customary and Traditional Use findings for the Kasilof and Kenai Rivers.
May 2007	FSB approves changes to Federal subsistence fishing regulations for Kenai Peninsula for the rural communities of Ninilchik, Cooper Landing, and Hope.
2008	FSB recognizes the customary and traditional use of moose by residents of the rural community of Cooper Landing.
2008	FSB grants a salmon fish wheel fishery on the Kasilof River for residents of the rural community of Ninilchik.
2010	FSB recognizes the customary and traditional use of moose and caribou[a] by residents of the rural community of Hope.
2011	FSB recognizes a customary and traditional use determination for residents of Ninilchik for all fish in the Kenai Peninsula District waters north of and including the Kenai River drainage.

[a] Rural residents of Hope can harvest one caribou by Federal registration permit on Federal lands

Under State of Alaska law, all Alaska residents are eligible to participate in personal use activities in State-defined non-subsistence use areas on state-owned lands. The State Joint Boards of Fish and Game classify all of the Kenai Peninsula, except areas around Seldovia, Nanwalek, and Port Graham, as a "non-subsistence area" (ADF&G 2014a). As a result, there are no fisheries or hunts considered "subsistence" in the project area on State lands or waters. Noncommercial net fisheries (dip net in the lower Kenai river, set net in portions of Cook Inlet) are classified as "personal use" (ADF&G 2014a).

The data presented within this document are focused on the harvests associated with the rural communities of Cooper Landing, Hope and Ninilchik in GMUs 7, 15A and 15 B (see Map 1). The FSB has designated these communities as rural, and the project crosses these GMUs. The

data used in this analysis is taken from available ADF&G publications and ADF&G's Community Subsistence Information System (CSIS) for these communities.

A survey of subsistence harvests for all resources in the upper Kenai Peninsula was conducted by ADF&G in 1990. This survey, which documented fish and wildlife resources use and harvest patterns for the communities of Cooper Landing, Hope, and Whittier, found that the three communities had very similar harvest quantities and range of resources used, shared and harvested(Seitz et al. 1992). A survey published in 2000 by ADF&G documented fish and wildlife resource uses by residents of selected areas of the Kenai Peninsula, including Ninilchik (Fall et al. 2000). In 2002, the FSB funded the ADF&G Division of Subsistence to conduct a subsistence-use household survey to document subsistence uses of fish in Kenai Peninsula communities including Cooper Landing, Hope, and Ninilchik. Patterns of subsistence use documented during this survey were found to be consistent with earlier studies (Fall et al. 2004). Further discussion of the results of these surveys is included in Section 4.

3 Proposed Action on Federal Lands

The reasonable alternatives being evaluated for the Sterling Highway MP 45-60 project are described in detail in Chapter 2, Project Alternatives, in the Sterling Highway MP 45-60 Supplemental Environmental Impact Statement (SEIS). The following is a brief summary of each alternative (see Map 2 for reasonable alternatives).

No Build Alternative. The No Build Alternative would not change the existing highway in the project area. The existing highway has one lane in each direction, limited shoulder space, tight curves, limited sight distance, and a posted speed limit of 35 miles per hour (mph) in areas. Some major highway maintenance would occur including: replacement of pavement (twice), replacement of three project area bridges due to age, and improvement of a curve at MP 45 as part of a programmed project.

Features Common to All Build Alternatives. Each of the build alternatives would be engineered based on highway design standards for rural principal arterials. The build alternatives are identical from MP 45 to MP 46.3, at the eastern end of the project, and from MP 55.8 to MP 60, at the western end of the project. Each alternative would consist of a two-lane highway with paved shoulders, passing lanes, and turning lanes. Travel lanes would be 12 feet wide, paved shoulders would be 8 feet wide (adequate for safe bicycle and pedestrian use), passing lanes would be 12 feet wide, and all major intersections would have right- and left-turn lanes. No new interchanges would be constructed, and T-intersections would be used where the "old" highway intersects new segments within each alternative.

See Chapter 2 (Alternatives) of the SEIS for more detail about the following build alternatives.

Cooper Creek Alternative. The Cooper Creek Alternative follows the existing Sterling Highway from the beginning of the project to the south side of the Cooper Landing Bridge. Approximately 10 miles of the existing highway would be rebuilt to meet current rural principal arterial standards and incorporate passing and turning lanes. Approximately 4 miles of the alternative would include a new alignment skirting Cooper Landing to the south. Two bridges, Cooper Landing Bridge and Schooner Bend Bridge, would be replaced under the Cooper Creek Alternative, and a new bridge would be constructed over Cooper Creek. The new bridge would be approximately 62 feet wide and 840 feet long and would accommodate two lanes, a passing lane, shoulders, and a future pathway on one side (no pathway is proposed at this time).

Several construction staging areas and sites for disposal of woody debris and soils would be required, the largest being a 44-acre area east of Cooper Creek.

G South Alternative. The G South Alternative would straighten and widen approximately 8 miles of the existing highway corridor along both ends of the project area, and construct 5.5 miles of new alignment skirting north of Cooper Landing and the Kenai River between existing MP 46.3 and MP 51.6. In areas where the G South Alternative uses the existing highway, the road would be widened to meet rural principal arterial standards, and would included west- and east-bound passing lanes. This alternative would include replacing one bridge over the Kenai River and constructing two new bridges, one over lower Juneau Creek and one over the Kenai River. It would also include constructing an underpass for the existing Slaughter Ridge Road, a logging road near a crossing of Bean Creek.

The G South Alternative avoids the Resurrection Pass National Recreation Trail and KNWR area while still providing a route north of the Kenai River.

Several construction staging areas and sites for disposal of woody debris and soils would be required, the largest being a 35-acre area west of Juneau Creek. A 27-acre disposal area is proposed east of Juneau Creek, as well as relatively small staging areas adjacent to each new or replacement bridge.

Juneau Creek Alternative. The Juneau Creek Alternative would straighten and widen approximately 4 miles of the existing highway at both ends of the project area, with approximately 9.5 miles of new alignment skirting north of Cooper Landing and the Kenai River. This alternative diverges at MP 46.3, climbs the hillside and crosses Juneau Creek Canyon with a new bridge south of the falls. The alignment would then descend the hillside, cross the Mystery Creek Wilderness in the KNWR, and rejoin the existing highway with a T-intersection at MP 55.8. The Juneau Creek Alternative then follows the existing highway for the remaining 3 miles to the end of the project.

The Juneau Creek Alternative crosses the Juneau Falls Recreation Area4, an area withdrawn from mining to preserve its use for recreation around the Juneau Creek Falls, crosses the Resurrection Pass Trail, and locates the new roadway in an area relatively undisturbed by settlement.

Several construction staging areas and sites for disposal of woody debris and soils would be required, the largest being a 27-acre area east of Juneau Creek and 4-acre access road. A 20-acre disposal area is proposed well west of Juneau Creek, as well as relatively small staging areas adjacent to the new Juneau Creek Bridge.

Juneau Creek Variant Alternative. The major difference between the Juneau Creek and Juneau Creek Variant alternatives is that the Juneau Creek Alternative was created on the best alignment for engineering and traffic purposes, but crosses the Mystery Creek Wilderness in the KNWR. The Juneau Creek Variant Alternative would be identical to the Juneau Creek Alternative with the primary difference being its avoidance of KNWR Wilderness. Beginning at a point approximately 1.5 miles west of the Juneau Creek Bridge, the variant would diverge from the Juneau Creek Alternative and then rejoin the existing alignment at MP 55 of the existing highway using a T-intersection. Access to Sportsman's Landing would occur off the "old" highway and would be slightly reconfigured as part of the re-routing of the western end of the "old" highway. The Juneau Creek Variant Alternative would be within the existing highway right-of-way at the KNWR boundary, and this alternative would avoid any impact to the KNWR designated Wilderness.

Construction staging areas would be the same as those described above for the Juneau Creek Alternative.

[4] The Juneau Falls Recreation Area is a 320-acre area of National Forest land withdrawn from mining for recreation purposes by 43 CFR Public Land Order 6888.

4 Affected Environment

In accordance with Title VIII of ANILCA, subsistence uses are allowed on federal public lands within the KNWR and the CNF. Federal regulations allow qualified rural residents to harvest fish, wildlife, plants, or other subsistence resources. Subsistence activities include hunting, fishing, trapping, picking, and gathering. In the vicinity of the Kenai River, subsistence resources harvested could include bear, moose, fish, small mammals, birds, berries, edible plants, and wood. Table 4-1 summarizes Federal subsistence wildlife regulations for GMUs 7, 15A and 15B, and Table 4-2 summarizes Federal subsistence fish regulations for the Cook Inlet area and the affected waters within the project area.

This analysis of subsistence uses and needs includes the three primary rural communities associated with subsistence use in the project area: Cooper Landing, Hope, and Ninilchik. These rural communities have Federal recognition of customary and traditional or subsistence uses for key subsistence species, such as fish and moose, in GMUs 7, 15A, and 15B. GMU 7 encompasses the eastern Kenai Peninsula; GMUs 15A and 15B lie within the eastern portion of the KNWR and abut GMU 7 (see Map 1).

The residents of Cooper Landing, Hope, and Ninilchik have recognized customary and traditional use of fish in the project area in the waters north of and including the Kenai River drainage within the KNWR and the CNF. Residents of Cooper Landing, Hope, and Ninilchik have subsistence rights for all fish in these waters. Residents of Ninilchik also have subsistence rights for all fish in waters of the Kasilof River drainage within the KNWR. Federal subsistence fishing permits are required for salmon, trout, and Dolly Varden/char in the Kenai and Kasilof River drainages. Seasons, harvest and possession limits, and methods and means of harvest for these harvests in the Kenai and Kasilof rivers are the same as the Alaska sport fishing regulations. Regulations provide for three dip net fisheries in the Kenai basin, one on the Russian River and two downstream of Skilak Lake, and a dip net fishery in the Kasilof River basin.

The FSB adopted regulations that recognized the customary and traditional use of moose by residents of Cooper Landing, allowing harvests GMUs Units 7, 15A, and 15B under Federal subsistence regulations. As detailed in Table 4-1, other subsistence harvests have recognized customary and traditional use including black and brown bear, caribou (Hope only), small mammals, and upland birds.

The CNF has prepared an EIS revising its Kenai Winter Access Plan (KWAP). Revisions to the KWAP will affect winter motorized access onto national forest lands for recreation as well as for subsistence uses. As it pertains to the project area, current management of Resurrection Pass National Recreation Trail allows a split season of motorized and non-motorized uses. Between May 1 and November 30, the trail is closed to motorized vehicles. No management units would have restricted motorized access for subsistence uses; motorized use for subsistence uses is allowed in all management units. In order to prohibit the use of snow machines for traditional activities or travel to and from villages and home sites, such use must be found to be detrimental to the resource values of the unit or area.

Table 4-1. Federal subsistence wildlife regulations for GMUs 7, 15A, and 15B, 2012/2014

Species	Customary & Traditional Use Determination	Game Management Unit 7	Game Management Unit 15A and 15B
Black Bear	• All rural residents (GMU 7) • Ninilchik (GMUs 15A/15B)	Harvest limit – 3 (July 1-June 30)	Harvest limit – 2 (July 1-June 30)
Brown Bear	Ninilchik (GMUs 15A/15B)	No Federal subsistence priority/open season	Harvest limit – 1 bear every 4 regulatory years (Oct. 1-Nov. 30)
Caribou	Hope (GMU 7)	• Harvest limit – 1 (Aug. 10-Dec. 31) • In area north of Sterling Highway and west of Seward Highway	No Federal open season
Moose	• Cooper Landing, Hope (GMU 7)[a] • Cooper Landing, Nanwalek, Ninilchik, Port Graham, Seldovia (GMUs 15A/15B)	• Harvest limit – 1 (Aug. 10-Sept. 20) • No Federal open season in portion draining into King's Bay • Brown Mountain hunt area (Nanwalek and Port Graham)	• 15A (Skilak Loop Wildlife Management Area) – no Federal open season • Harvest limit for 15A (remainder), 15B – 1 antlered bull (Aug. 10-Sept. 20) • Harvest limit for 15B – 1 antlered bull (Oct. 20-Nov. 10)
Goat		• No Federal open season	No Federal open season
Sheep		No Federal subsistence priority/open season	No Federal subsistence priority/open season
Small mammals	All rural residents	• Beaver – 1 (May 1-Oct. 10) • Coyote – no limit (Sept. 1-April 30) • Hare – no limit (July 1-June 30) • Lynx - 2 (Nov. 10-Jan. 31) • Wolf (KNWR) – 2 (Aug. 10-Apr. 30) • Wolf (remainder) – 5 (Aug. 10-Apr. 30)	• Coyote – no limit (Sept. 1-April 30) • Hare – no limit (July 1-June 30) • Lynx - 2 (Nov. 10-Jan. 31) • Wolf (KNWR) – 2 (Aug. 10-Apr. 30) • Wolf (remainder) – 5 (Aug. 10-Apr. 30) • Wolverine – 1 (Set. 1-Mar. 31)
Game birds	All rural residents	• Grouse (spruce) – 10/day (Aug. 10-Mar. 31) • Ptarmigan – 20/day (Aug. 10-Mar. 31)	• Grouse (spruce) – 15/day (Aug. 10-Mar. 31) • Ptarmigan – 20/day (Aug. 10-Mar. 31)

[a] In the portion of GMU 7 draining into King's Bay, rural residents of Chenega Bay, Cooper Landing, Hope, and Tatitlek have a customary and traditional use determination for moose. However, Federal public lands in the King's Bay area are closed to the harvest of moose, and there is no Federal open season.

Source: Federal Subsistence Management Program 2014a and 2014b

Table 4-2. Federal subsistence fish regulations for the Cook Inlet area, 2013/2015

Species	Customary & Traditional Use Determination	Location	Harvest Limits/Season
Smelt	All rural residents	Cook Inlet area	• No limit (Apr. 1-June 15) • Dipnets in freshwater
Fish other than salmon, trout, Dolly Varden/char, smelt, grayling, and burbot	All rural residents	Cook Inlet area	No limit (year round)
Salmon, trout, Dolly Varden/char, smelt, grayling, and burbot	All rural residents	Remainder of the Cook Inlet area	No limit (year round)
All fish (Federal subsistence permit required for salmon, trout, and Dolly Varden/char)	Cooper Landing, Hope, and Ninilchik	Kenai Peninsula District, waters north of and including the Kenai River drainage within the KNWR and CNF	Seasons, harvest and possession limits, and methods and means are the same as for the taking of those species under Alaska sport fishing regulations
All fish (Federal subsistence permit required for salmon, trout, and Dolly Varden/char)	Ninilchik	Waters within the Kasilof River drainage within the KNWR	Seasons, harvest and possession limits, and methods and means are the same as for the taking of those species under Alaska sport fishing regulations

Source: Federal Subsistence Management Program 2014c

4.1 Fish and Wildlife Resource Harvests for Cooper Landing, Hope, and Ninilchik

The harvests of fish and wildlife were documented in the 1990, 1998, and 2002 ADF&G studies in Cooper Landing, Hope, and Ninilchik (Seitz et al. 1992; Fall et al. 2000; Fall et al. 2004). These studies quantify resource harvests taken under both Federal subsistence regulations and State regulations. The patterns of harvest in these communities generally followed seasonal availability and harvest regulations. Tables 4-3 and 4-4 present the estimated harvests of fish and wildlife, and are referenced and discussed in the following subsections.

4.1.1 Cooper Landing

The 1990 ADF&G survey found that the harvest of fish and wildlife resources in the Cooper Landing area totaled 91.5 pounds per person, and the average household harvest totaled 238 pounds with 94 percent of households harvesting fish and wildlife resources (Seitz et al. 1992). Quantities of specific resources harvested and the percentages of households harvesting particular resources are detailed in Tables 4-3 and 4-4.

Table 4-3. Estimated harvest of fish and wildlife resources

	Harvested Pounds per Household (per Person)		
Resource	**Cooper Landing, 1990**	**Hope, 1990**	**Ninilchik, 1998**
All resources	238 (91.5)	262.2 (110.7)	439.5 (163.8)
Fish	140.2 (53.9)	155.9 (65.8)	216.7 (80.8)
Salmon	102.6 (39.5)	118.5 (50.1)	113.9 (42.5)
Non-salmon fish	37.6 (14.5)	37.4 (15.8)	102.8 (38.3)
Land mammals	75 (28.8)	77.7 (32.8)	177.7 (66.2)
Large land mammals	74.5 (28.6)	73.8 (31.1)	176.2 (65.7)
Small land mammals	0.5 (0.2)	3.9 (1.7)	1.5 (0.6)
Marine mammals	0 (0)	0 (0)	0 (0)
Birds and eggs	6.4 (2.5)	5.6 (2.4)	3.8 (1.4)
Migratory birds	1.2 (0.5)	0.9 (0.4)	1.2 (0.5)
Other birds	5.2 (2.0)	4.8 (2.0)	2.6 (1.0)
Marine invertebrates	5.9 (2.3)	9.5 (4.0)	29.6 (11)
Vegetation	10.6 (4.1)	13.5 (5.7)	11.7 (4.4)

Source: ADF&G (2014b)

Table 4-4. Estimated harvest of select fish and wildlife resources

	Percent of Households Harvesting		
Resource	**Cooper Landing, 1990**	**Hope, 1990**	**Ninilchik, 1998**
All Resources	94%	94%	96%
Berries	64%	75%	59%
Sockeye Salmon	56%	33%	45%
Coho Salmon	44%	33%	38%
Dolly Varden	44%	53%	14%
Plants/Greens/Mushrooms	35%	39%	20%
Grouse	25%	17%	29%
Halibut	25%	25%	60%
Lake Trout	18%	10%	2%
Chinook Salmon	15%	19%	47%
Moose	10%	9%	21%

Source: ADF&G (2014b)

The 2002 study surveyed residents regarding the harvest and use of fish in 103 Copper Landing households. The study found that 90 percent of Cooper Landing households used fish, about 73 percent of households harvested fish, and 62 pounds of fish were harvested per person (Fall et al. 2004). This is similar to the 1990 survey, which reported that 91 percent of households used fish, almost 72 percent of households harvested fish, and 54 pounds of fish were harvested per person (ADF&G 2014b). Table 4-5 summarizes the most common types of fish harvested within the Cooper Landing area as reported during the 2002 survey.

Table 4-5. Estimated harvest of select fish resources, 2002-2003

	Cooper Landing		Hope		Ninilchik	
Resource	Pounds per Person	Percent Households Harvesting	Pounds per Person	Percent Households Harvesting	Pounds per Person	Percent Households Harvesting
All Fish	61.7	73%	62.4	67%	81.8	73%
Sockeye Salmon	28.0	62%	14.8	30%	20.7	54%
Coho Salmon	12.2	45%	17.8	45%	11.1	41%
Halibut	10.5	29%	10.5	18%	28.8	53%
Chinook Salmon	4.2	18%	4.2	12%	8.4	38%
Lake Trout	2.2	16%	0.1	3%	0.8	6%
Dolly Varden	1.4	26%	1.6	28%	0.6	12%
Rainbow Trout	1.2	20%	0.9	10%	1.8	6%
Black Rockfish	0.7	3%	0.6	7%	0.8	7%
Eulachon	0.6	2%	1.4	8%	1.3	5%

Source: Fall, Stanek, et al. (2004)

4.1.2 Hope

For the community of Hope, the 1990 ADF&G survey reported the per person harvest of fish and wildlife resources totaled 110.7 pounds, and the average household harvest totaled 262 pounds with 94 percent of households harvesting fish and wildlife resources (Seitz et al. 1992). Quantities of specific resources harvested and the percentages of households harvesting particular resources are detailed in Table 4-3 and Table 4-4.

For the 60 households surveyed in Hope during the 2002 study, it was found that 83 percent of households used fish, almost 67 percent of households harvested fish, and 62 pounds of fish were harvested per person (Fall et al. 2004). This is similar to the 1990 survey, which reported that 92 percent of households used fish, 70 percent of households harvested fish, and 66 pounds of fish were harvested per person (ADF&G 2014b). Table 4-5 summarizes the types and amount of each fish type harvested per person by residents of Hope.

4.1.3 Ninilchik

A survey of selected Kenai Peninsula communities, including Ninilchik, documented non-commercial uses of fish, wildlife and plant resources in 1982 (Reed 1985). However, ADF&G does not consider this data to be representative of harvests for the community, and it will not be reported in this document. A 1998 survey conducted on fish and wildlife resource uses of selected communities within the Kenai Peninsula Borough included data on wildlife harvests for the community of Ninilchik (Fall et al. 2000). This ADF&G survey reported the per person harvest of fish and wildlife resources totaled 163.8 pounds, and the average household harvest totaled 439.5 pounds with 96 percent of households harvesting fish and wildlife resources (Fall et al. 2000). Quantities of specific resources harvested and the percentages of households harvesting particular resources for Ninilchik are detailed in Table 4-3 and Table 4-4.

The 2002 survey interviewed 100 Ninilchik households and found that 96 percent of households used fish, 73 percent of households harvested fish, and almost 82 pounds of fish were harvested per person (Fall et al. 2004). This is similar to the 1998 survey, which reported that 97 percent of households used fish, 73 percent of households harvested fish, and 81 pounds of fish were harvested per person (ADF&G 2014b). Table 4-5 summarizes the top fish resources harvested in Ninilchik.

4.1.4 Summary

For Cooper Landing, Hope, and Ninilchik residents, moose is the most harvested wildlife resource (9-20 percent of households harvesting; Table 4-4). In 1990, the estimated total community harvest of moose for Cooper Landing was 10 animals or 18.7 pounds per person (Seitz et al. 1992). During the same year, the estimated total community harvest for moose for Hope was 6 animals or 19.0 pounds per person, the highest of any single resource harvested (Seitz et al. 1992). Historically, moose have been an important source of food for both Cooper Landing and Hope. Between 1975 and 1990, Hope residents reported harvesting an average of 3.3 moose per year for the entire community and Cooper Landing residents reported harvesting an average of 5.4 moose per year for the entire community (Seitz et al. 1992). In 1998, moose represented the highest percent of Ninilchik residents' total harvest for the community (95 animals or 0.1 moose per person) (Fall et al. 2000).

Fish are harvested by more than two-thirds of the residents (67-73 percent; Table 4-5) and represent more than half of the total harvest of the three communities. Coho salmon, sockeye salmon, and halibut represent the majority of the total fish harvest in the three communities based on pounds per person (69-82 percent; Table 4-5). As documented during the 1990 survey, salmon harvests by the residents of Cooper Landing and Hope were taken largely under State sport fishing regulations and not under Federal subsistence regulations (Seitz et al. 1992). The 2002 household survey noted that less than 12 percent of all salmon harvested by both Cooper Landing and Hope residents were taken under subsistence regulations (Fall et al. 2004). In 2002, 30 percent of the total salmon harvested by Ninilchik residents was through subsistence methods (Fall et al. 2004).

The majority of Cooper Landing, Hope and Ninilchik households (59-75 percent; Table 4-4) harvested berries. Other commonly harvested resources include other plants, such as greens and mushrooms, and grouse.

4.2 Harvest Locations for Cooper Landing, Hope, and Ninilchik

The majority of the project area is located within GMU 7 and a smaller portion is located in both GMU 15A and 15B. The locations used to harvest fish were documented in the 1990, 1998, and 2002 ADF&G studies in Cooper Landing, Hope, and Ninilchik.

Residents of Cooper Landing primarily used Federal public lands and adjacent waters for access to fishing areas. In particular, the upper Kenai and Russian rivers were most frequently fished for sockeye salmon (Table 4-6). Kenai Lake and its tributary streams, also federally managed for subsistence purposes, were a primary fishing location for Dolly Varden and lake trout. The lower Kenai River, which is State-managed, was an important source of Chinook salmon, sockeye salmon, and coho salmon (Fall et al. 2004).

Table 4-6. Federal public waters used to harvest fish, Cooper Landing 2002/2003

	Percentage of Cooper Landing Households								
Area Fished	**Chinook**	**Sockeye**	**Coho**	**Chum**	**Pink**	**Dolly Varden**	**Rainbow Trout**	**Lake Trout**	**Hooligan**
Kenai Lake and Kenai Lake Streams	0	0	1	0	1	16	8	15	0
Kenai Mountain Streams	0	0	0	0	0	5	10	4	0
Russian River	0	40	14	0	1	3	4	1	0
Swanson River	0	0	0	0	0	1	3	0	0
Upper Kenai River, Skilak Canyon	2	29	16	0	0	7	2	1	0

Source: Fall et al. 2004

Hope residents (including the town of Sunrise) primarily used Kenai mountain streams in the CNF and the KNWR to harvest salmon and non-salmon fish resources (Table 4-7). Other important non-Federal waters fished for salmon were the lower Kenai River, Kasilof River, Crooked Creek, and Resurrection Bay. The northern portion of the Cook Inlet was also an important area fished for hooligan (Fall et al. 2004).

Table 4-7. Federal public waters used to harvest fish, Hope 2002/2003

Area Fished	Percentage of Cooper Landing Households								
	Chinook	**Sockeye**	**Coho**	**Chum**	**Pink**	**Dolly Varden**	**Rainbow Trout**	**Lake Trout**	**Hooligan**
Kenai Lake and Kenai Lake streams	0	2	0	0	0	3	2	0	0
Kenai mountain streams	3	0	35	12	20	17	3	2	2
Russian River	0	12	2	0	0	0	2	0	0
Swanson River	0	0	0	0	0	2	2	0	0
Upper Kenai River, Skilak Canyon	0	7	5	0	0	3	0	2	0

Source: Fall et al. 2004

Fish harvests by Ninilchik residents on Federal public lands within the project area were substantially lower when compared to Cooper Landing and Hope. For the community of Ninilchik, 4 percent of households harvested sockeye from the Russian River, and 1 percent of households harvested trout from Kenai Lake, Kenai Lake tributary streams, and Kenai mountain streams (Fall et al. 2004; Table 4-8). Other important non-federal waters fished for salmon were the lower Kenai River, Deep Creek, Ninilchik River and the Cook Inlet (Fall et al. 2004).

Table 4-8. Federal public waters used to harvest fish, Ninilchik 2002/2003

Area Fished	Percentage of Cooper Landing Households								
	Chinook	Sockeye	Coho	Chum	Pink	Dolly Varden	Rainbow Trout	Lake Trout	Hooligan
Kenai Lake and Kenai Lake streams	0	0	0	0	0	0	1	1	0
Kenai mountain streams	0	0	0	0	0	0	1	0	0
Russian River	0	4	2	0	0	0	2	0	0

Source: Fall et al. 2004

Mapped data were collected from some of the surveyed households during the 1990 ADF&G survey, providing general locations within Southcentral Alaska of fish and wildlife resource use areas for Cooper Landing and Hope (ADF&G 1994). Generally speaking, the project area was used by residents of Hope and Cooper landing for harvesting salmon, non-salmon fish, black bear, moose, and furbearers. Cooper Landing residents also reported harvesting vegetation, birds, goats, sheep and firewood in the approximate project area. These maps do not detail whether fish and wildlife resource use areas occurred on Federal or State lands or any information on access points to these areas. Data on moose harvests, where harvest locality is also general, exist only at the GMU level, and does not help to determine where subsistence moose hunting is occurring within the project area. ADF&G data does not indicate whether moose harvests within GMU 7 were made by residents of Cooper Landing, Hope, or by residents from another community within this GMU.

For the community of Ninilchik, the 1998 ADF&G survey provides general locations of fish and wildlife resource harvests also at the GMU level (Fall et al. 2000). The data presented in Table 4-9 illustrate the relatively low level of usage of the project area by Ninilchik residents for harvesting fish and wildlife resources.

Table 4-9. Percentage of Ninilchik households harvesting select fish and wildlife resources within specific GMUs, 1998

Resource Type		Location of Reported Harvest		
		GMU 15A: Kenai National Wildlife Refuge (KNWR)	GMU 15B: KNWR	GMU 7: KNWR and Chugach National Forest
Salmon		2%	3%	2%
Non-salmon		0%	1%	1%
Moose	Hunt	0%	1%	0%
	Harvest	0%	1%	0%
Dall sheep	Hunt	0%	2%	0%
	Harvest	0%	2%	0%
Brown bear	Hunt	0%	1%	0%
	Harvest	0%	0%	0%
Black bear	Hunt	0%	1%	0%
	Harvest	0%	0%	0%

Source: Fall et al. 2000.

5 ANILCA 810 (a) Evaluations and Findings for All Alternatives

ANILCA 810 requires an evaluation of potential impacts to subsistence uses on Federal public lands and waters. As discussed in Section 2, ANILCA 810(a) requires that this evaluation include findings on three specific issues:

- The effect of such use, occupancy or disposition on subsistence uses and needs (Section 5.1)
- The availability of other lands for the purpose sought to be achieved (Section 5.2); and
- Other alternatives that would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes (Section 5.3) (16 USC § 3120)

Each alternative, including the No Build and four build alternatives as well as the cumulative case, is discussed and evaluated below by issue to avoid and reduce repetition. This evaluation is based on information provided above in Section 4 regarding areas and resources important for subsistence use. In addition, this evaluation relies on information provided in Chapter 3 of the SEIS regarding fish (Section 3.21) and wildlife (Section 3.22) populations and habitats as well as cumulative impacts to these resources (Section 3.27).

5.1 The Effect of Such Use, Occupancy or Disposition on Subsistence Uses and Needs

To address this issue, the reasonable alternatives were analyzed using three further evaluation criteria related to existing subsistence resources that could be impacted that include:

- Potential to reduce subsistence uses caused by changes in resources, resource habitat, or competition for resources; (Section 5.1.1);
- Potential to reduce subsistence uses due to changes to resource availability due to alteration in resource migration patterns or distribution (Section 5.1.2); and
- Potential to reduce subsistence uses due to physical or legal barriers to accessing resources (Section 5.1.3).

The proposed project could have direct and indirect effects on subsistence activities and uses. Direct effects on subsistence uses could be caused by changes in resource availability, access, or competition. Indirect effects to subsistence uses could be caused by subsistence users' responses to direct effects, contamination concerns, and changes in culturally significant activities associated with subsistence practices (e.g., harvesting, processing, transferring knowledge, adhering to a traditional diet, and maintaining integrity of culturally significant places). Indirect effects on subsistence users could also be caused by resource responses to potential habitat fragmentation, resource disturbance, or changes in resource movement patterns.

5.1.1 Changes in Resources, Habitat, or Competition for Resources

5.1.1.1 No Build Alternative

Under the No Build Alternative, there would be no new construction. However, ongoing operations, and maintenance activities, including projected replacement of the existing bridges over the Kenai River, could have an impact on subsistence resources and habitat. Under the No

Build Alternative, there would be negligible new direct effects to subsistence uses, subsistence access, or competition for subsistence resources. However, as traffic levels, human population, and recreation increases, resources may increasingly avoid or reduce use of habitats along the highway, habitat quality may decrease, and injury or mortality of resources may occur from increased collisions or hazardous materials spills.

A majority of the existing highway is within 500 feet of the Kenai River and its tributaries, presenting an increased risk that vehicle crashes could spill pollutants with little buffer or opportunity for cleanup before they would reach the river (see Section 3.17 for discussion of hazardous material spill risks). Projected increased traffic on the existing highway could result in greater runoff of roadway debris and pollutants, which could adversely affect fish habitat immediately adjacent to the highway (see Sections 3.13 and 3.21 for additional discussion of impacts to water quality and fish, respectively).

In addition, competition for resources may increase as human population and use of the area increases. Larger numbers of both subsistence and recreational users could be competing for the same resources. However, for resources such as fish and moose, harvests are restricted on Federal lands and waters to residents of local rural communities. Concentrated fishing pressure and associated stream bank erosion could also increase as human population and recreational use of the area increase (see Section 3.21 for additional discussion of impacts to fish).

5.1.1.2 All Build Alternatives

All of the build alternatives share general impacts to subsistence resources, habitat or competition. The build alternatives could result in slight differences in impact levels due to differences in the amount and quality of subsistence resource habitat impacted and differences in the number and types of bridges and culverts that could affect fish and their habitat. Impacts specific to alternatives are discussed in the following sections.

Impacts to fish and wildlife resources may occur as a result of construction and operation of the build alternatives. Changes to the landscape can influence wildlife populations through habitat loss, changes in habitat suitability, changes in habitat use, or reduced survival (see Section 3.22, Wildlife, of the SEIS for further discussion of these impacts). Impacts to subsistence uses in the project area may include resources avoiding or reducing use of habitat along the highway, actual loss of habitat within the new alignment, decreased habitat quality, fragmentation of habitat, and injury or mortality of resources from collisions or hazardous materials spills.

Some habitat for wildlife would be altered or destroyed by construction of new highway segments. In addition, direct mortality from vehicle collisions could increase where new alignments cross high-quality habitat and from increased traffic volume coupled with higher traffic speeds. However, new and reconstructed highway segments would be wider with substantially better sight distance throughout its length, allowing for increased visibility and maneuvering room for both drivers and wildlife.

Similar to the No Build Alternative, the projected growth in traffic levels and recreation in the project area under all build alternatives could create additional pressures on subsistence resources located along the existing highway and increase competition for those resources. If poorly managed, additional and concentrated fishing pressure could reduce habitat and habitat quality, primarily though trampling of river banks and riparian vegetation. A possible increase in

competition for subsistence resources could occur because of larger numbers of both subsistence and recreational users vying for the same resources.

The new areas of habitat impact would contribute to fish and wildlife displacement and habitat fragmentation; however, as can be seen in the case of moose, the loss of habitat includes a negligible portion of their total habitat. Table 5-1 provides general details on potential impacts to subsistence resource habitats. Further discussion of habitat loss by alternative is included in the following sections.

Table 5-1. Potential impacts to select fish and wildlife resource habitat by alternative

	Build Alternatives			
	Cooper Creek	**G South**	**Juneau Creek**	**Juneau Creek Variant**
Miles of new roadway [a]	4	6	10.0	9.0
Miles of roadway on Federal lands	1.4	1.9	4.0	3.4
Number of new culvert crossings or stream rerouting of anadromous fish streams	5	5	1[b]	1
Number of new or replacement bridges	3[b]	3[c]	1[c]	1[c]
Acres of wetlands impacted	11.0	26.6	38.7	37.5
Total moose habitat acres impacted (% of habitat type in project area)[d]	204 (1%)	216 (1%)	277 (2%)	266 (2%)
Total upland game bird habitat acres impacted [e]	83	107	106	109
Total Essential Fish Habitat (EFH) impact (acres)[f]	1.2	1.0	0.8	0.8

[a] "New roadway" is defined as the length of constructed highway that diverges from the existing highway alignment.

[b] The Cooper Creek Bridge crossing is a clear-span design and would not result in any in-stream construction.

[c] The Juneau Creek Bridge crossing is a clear span design and would not result in any in-stream construction.

[d] See Section 3.22.4 (Wildlife) and Table 3.22-11 in the Wildlife section of the SEIS for further information on possible impacts to moose. The impacts to other mammals such as black bear, wolf, and lynx would be similar to those for moose.

[e] See Section 3.22 (Wildlife) and Table 3.22-13 in the Wildlife section of the SEIS for further information.

[f] See Section 3.21 (Fish and Essential Fish Habitat) and Tables 3.21-4, 3.21-5, and 3.21-6 in the Fish and Essential Fish Habitat section of the SEIS for further information.

In addition to improving upon the capacity and safety standards for the Sterling Highway, all build alternatives would decrease the risk of a containment spill into the Kenai River by moving the alignment away from the river (see Section 3.17, Hazardous Waste Sites and Spills, of the SEIS. Design upgrades, such as widening and straightening the roadway, would also serve to decrease the possibility of collisions of vehicles carrying hazardous substances. According to the ADF&G Division of Subsistence, by routing the Sterling Highway away from the Kenai River, which would reduce the risk of a hazardous substance spill into the river, any of the build alternatives may serve to safeguard aquatic resources and habitat within the project area (Fall 2005). Fuel spills may directly affect resource populations and habitat as well as users' perceptions regarding contamination of the resource, reducing their use of the resource.

Salmon represents one of the most heavily used subsistence resources for the rural communities of Cooper Landing, Hope, and Ninilchik. Several anadromous fish streams within the project area could potentially be affected during the replacement of old bridges and construction of new bridges. All build alternatives would require new and/or replacement bridges that would span anadromous fish streams. Of primary concern would be suspended silt in runoff which could adversely affect adult or juvenile fish in the stream or, if deposited, could suffocate eggs in the streambed. However, not all bridges would require in-stream construction such as the Cooper Creek and Juneau Creek bridges. In those cases, impacts to fish habitat and populations would be minimized (see SEIS Section 3.21.2).

All build alternatives also include culverts in anadromous fish streams. The primary impacts of culverts on fish resources would be changes in stream flow that could affect fish passage under the highway, elimination of habitat, and reduction of habitat quality where culverts would replace natural habitat. Where old culverts under the existing highway would be replaced with new culverts built to modern standards and often at larger diameter, it is possible that fish passage would be established where it had previously been cut off. Permanent direct impacts to fish and fish habitat from culvert installation and bridge construction and/or replacement from the build alternatives would be minor. Because of required culvert design features to preserve fish passage for all build alternatives, there would be minimal permanent loss of fish populations or habitat (SEIS Section 3.21.2.2). See SEIS Section 3.21.2 (Fish and Essential Fish Habitat) for a detailed analysis of direct and construction impacts to resident and anadromous fish populations and habitat.

Moose inhabit the entire project area, and all build alternatives would impact moose habitat through alteration and destruction resulting from new highway construction and vegetation clearing. However, the total habitat impacts under the build alternatives would be only 1 to 2 percent of total moose habitat in the project area. In addition, the construction of new roadway has the potential to impact the availability of moose as a subsistence resource due to wildlife displacement and habitat degradation and fragmentation. The ADFG believes that in some areas of the Kenai Peninsula, the moose population is in a slow but steady decline because of declining habitat quality, predation, mortality caused by vehicle collisions, and weather, especially in GMU 7. Section 3.22.1 (Wildlife) of the SEIS includes detailed information about moose populations and habitat. Impacts to moose populations and numbers are included in SEIS Section 3.22.4.

The build alternatives could also impact the other wildlife species and their habitat, including Dall sheep, mountain goat, lynx, wolves, and black and brown bears due to wildlife displacement and habitat degradation and fragmentation as well as mortalities caused by vehicle collisions and human-wildlife conflicts (i.e., Defense of Life and Property for bears). These species, however, do not constitute a significant proportion of wildlife resources harvested by Cooper Landing, Hope, and Ninilchik residents. Section 3.22 (Wildlife) of the SEIS provides a detailed analysis on project impacts to other wildlife species and their habitats.

An increase in competition for resources could occur as a result of constructing new roads in previously unaffected areas and opening new access. In addition, changes to trails and trailheads might increase access and shift subsistence uses to new areas. The build alternatives would intersect several trails in the project area and would affect access to CNF lands used for subsistence activities and connectivity of trails in the project area. Depending on the build alternative selected, some trails would be rerouted and additional trailhead areas would be

provided [see Section 3.8, Park and Recreation Resources, and 4(f)]. Any improved access to subsistence use areas could indirectly affect the intensity of subsistence harvests by subsistence users. Improved access could also impact availability of resources from recreational hunting and fishing. Increased access to previously inaccessible or difficult-to-access areas could also introduce an increase in competition for unregulated subsistence resources such as berries, eggs, or wood. The potential changes to subsistence opportunities and increased access could be viewed as beneficial to some, while others may view the increased competition as an adverse impact.

As reported during consultation for this project, the ADF&G Division of Subsistence stated that they did not believe any of the project's build alternatives would negatively impact subsistence resources or reduce subsistence use opportunities (Fall 2005).

5.1.1.3 Cooper Creek Alternative

The Cooper Creek Alternative would rebuild approximately 10 miles of the existing highway and construct approximately 4 miles of new alignment skirting Cooper Landing to the south. Where construction is outside the existing highway right-of-way, resource habitat loss will occur.

The Cooper Creek Alternative would result in the loss of approximately 204 acres of moose habitat, or 1 percent of the total moose habitat in the project area (Table 5-1). A small portion (2 acres) of this loss is considered high-quality moose habitat. An additional 92 acres of moose habitat could be directly impacted during construction from staging areas and disposal sites; however, these impacts would be temporary and could result in improved moose forage in these areas. Given the negligible impact to moose habitat, the impact to subsistence uses in regards to moose habitat would also be negligible. A detailed discussion of impacts to moose populations and habitat from the Cooper Creek Alternative is included in Section 3.22.4.3 (Wildlife) of the SEIS.

The Cooper Creek Alternative would require replacement of two bridges, Cooper Landing Bridge and Schooner Bend Bridge, and construction of a new bridge over Cooper Creek. However, the Cooper Creek Bridge would be a clear-span design and would not involve an in-stream construction. For replacement bridges, no permanent impacts would be expected because construction would be in almost the same locations and similar sizes as the existing bridges and highway. Potential impacts to fish habitat would be negligible and temporary, and would have negligible impact on subsistence uses. A detailed discussion of impacts to fish populations and habitat from the Cooper Creek Alternative is included in Section 3.21.2.3 (Fish and Essential Fish Habitat) of the SEIS. As impacts to fish habitat and populations from the Cooper Creek Alternative are anticipated to be negligible, the impact on subsistence uses in regards to fish habitat and population would also likely be negligible.

5.1.1.4 G South Alternative

The G South Alternative would straighten and widen approximately 8 miles of the existing highway corridor along both ends of the project area, and construct approximately 6 miles for a new alignment skirting north of Cooper Landing and the Kenai River between existing MP 46.3 and MP 51.6. As stated above, where construction is outside the existing highway right of way, resource habitat loss would occur.

The alternative crosses currently unaffected wildlife habitat areas, including the lower Juneau Creek delta area. As discussed in Section 4.1, moose is a key wildlife resource. The G South Alternative would result in the loss of approximately 216 acres of moose habitat, or 1 percent of the total moose habitat in the project area (Table 5-1). A portion of this loss is considered high-quality moose habitat, including a large logged area east of Juneau Creek and an area near Bean Creek where USFS conducted a hazardous fuels reduction project. Both new and existing highway segments cross areas of predicted use for wildlife such as moose. An additional 114 acres of moose habitat could be directly impacted during construction from staging areas and disposal sites; however, these impacts would be temporary and could result in improved moose forage in these areas. A detailed discussion of impacts to moose populations and habitat from the G South Alternative is included in Section 3.22.4.4 (Wildlife) of the SEIS. Given the negligible impact to wildlife habitat, the impact to subsistence uses in regard to wildlife populations and habitat would also be negligible.

The G South Alternative would require replacement of one bridge over the Kenai River and construction of two new bridges, one over lower Juneau Creek and one over the Kenai River. The Juneau Creek Bridge would be a clear-span design and would not involve in-stream construction, so no impacts to fish populations or habitat are anticipated. Construction of a new bridge across the Kenai River would permanently change fish habitat as a result of in-stream construction, altering flows around bridge piers, and shadowing from bridge structures. However, this impact is expected to be minimal to resident fish species. The existing Schooner Bend Bridge would be replaced, but no permanent impact to fish populations and habitat would be expected, because the new bridge would be in nearly the same location and would be of similar size and configuration. Potential impacts to fish habitat during reconstruction of the bridges under the G South Alternative would be negligible and temporary, and would have negligible impact on subsistence uses. A detailed discussion of impacts to fish populations and habitat from the G South Alternative is included in Section 3.21.2.4 (Fish and Essential Fish Habitat) of the SEIS. As impacts to fish habitat and populations from the G South Alternative are anticipated to be negligible, the impacts on subsistence uses in regards to fish habitat and population would also be negligible.

The G South Alternative would also include constructing an underpass for the existing Slaughter Ridge Road, a logging road near a crossing of Bean Creek. This could facilitate access by subsistence and other users, and increase competition for resources in the area.

5.1.1.5 Juneau Creek and Juneau Creek Variant Alternatives

The Juneau Creek Alternative would straighten and widen approximately 4 miles of the existing highway at both ends of the project area, with approximately 10 miles of new alignment north of the existing roadway between existing MP 46.3 and 55 skirting north of Cooper Landing. The Juneau Creek Variant Alternative would straighten and widen approximately 5 miles of the existing highway at both ends of the project area, with approximately 9 miles of new alignment skirting north of Cooper Landing. An overpass or underpass would be provided to accommodate logging trucks on two USFS roads located west of Juneau Creek; however, no connections between the highway and these roads would be provided.

The Juneau Creek alternatives would not replace any existing bridges, but would construct a new bridge over Juneau Creek. The Juneau Creek Bridge crossing is a clear span design and would not result in any in-stream construction, so no impacts to fish populations or habitat are

anticipated. As impacts to fish habitat and populations from the Juneau Creek alternatives are anticipated to be negligible, the impacts on subsistence uses in regards to fish habitat and population would also be negligible.

The Juneau Creek and Juneau Creek Variant alternatives would affect approximately 277 and 266 acres of moose habitat, respectively, representing approximately 2 percent of the total moose habitat in the project area (Table 5-1). A portion of this loss is considered high-quality moose habitat, including several logged areas east and west of Juneau Creek as well as an area near Bean Creek where USFS conducted a hazardous fuels reduction project. A 106-acre wildlife habitat improvement area is north of the proposed Juneau Creek and Juneau Creek Variant alternatives' alignments and would not be affected by these alternatives. Both new and existing highway segments cross areas of predicted use for wildlife such as moose. Construction activities for the Juneau Creek and Juneau Creek Variant alternatives would result in temporary impacts to approximately 119 and 118 acres, respectively, of moose habitat. A detailed discussion of impacts to moose populations and habitat from the Juneau Creek alternatives is included in Section 3.22.4.5 (Wildlife) of the SEIS. Given the negligible impact to wildlife habitat under these alternatives, the impact to subsistence uses would also be negligible.

Under the Juneau Creek alternatives, two new trailheads will be built where the alignment intersects the Resurrection Pass Trail and Bean Creek Trail. The construction of new trailheads would provide new access points for both the Resurrection Pass Trail and the Bean Creek Trail, which potentially could increase the number of trail users and therefore increase competition for subsistence resources on adjacent federal public lands.

5.1.1.6 Cumulative Case

Section 3.27 of the SEIS includes a cumulative impacts analysis for the proposed project. This analysis considered all past, present, and reasonably foreseeable future projects and actions that could result in impacts on human and environmental resources in the project area. Past actions included construction of roads/highways, establishment of the National Moose Range (now KNWR) and the Kenai River Special Management Area, and development of the Cooper Lake Hydroelectric Facility. A present action includes the USFS's CNF Bean North Management project under the Healthy Forest Restoration Act. Reasonably foreseeable future actions include the Sterling Highway Maintenance and Bridge Replacement program (see Section 3, No Build Alternative); the Sterling Highway Rehabilitation and Passing Lanes (MP 58-79) project; the Cooper Landing Senior Citizen Housing Development; Cooper Lake Hydroelectric Facility development; Cook Inlet Region, Incorporated (CIRI) land development; Skilak Wildlife Recreation Area improvements; Cooper Landing residential land development; State Land Management Unit 394B or 395 rural residential development; and Cooper Landing Walkability Improvements.

Subsistence was determined to have inconsequential impacts in association with the No Build and four build alternatives and was not identified as a national, regional, or local issue of importance (see Section 3.27.3, Cumulative, of the SEIS). The SEIS has found that the alternatives would not alter the availability of or competition for subsistence resources. While the No Build Alternative would not result in any new construction in the project area, ongoing operations and maintenance activities would occur. The actions associated with the Sterling Highway Maintenance and Bridge Program could potentially include short-term construction-related impacts to subsistence resources, resource habitat, and competition for resources. The

limits of construction for the replacement of bridges and curve realignment for these actions have not yet been determined; therefore, specific impacts to subsistence resources and harvests during construction have not been determined. However, these impacts are expected to result in negligible to minor impacts on subsistence uses.

5.1.2 Changes in Resource Availability due to Alteration in Migration Pattern or Distribution of Resources

5.1.2.1 No Build Alternative

Under the No Build Alternative, there would be no new construction. Ongoing operations, and maintenance activities, including projected replacement of the existing bridges over the Kenai River could have minor impacts on fish and wildlife migration patterns and distribution (see Section 3.21, Fish and Essential Fish Habitat and Section 3.22, Wildlife). However, these activities would likely have negligible new direct effects on subsistence resource availability from changes in resource migration patterns or distribution.

5.1.2.2 All Build Alternatives

All of the build alternatives share common impacts to subsistence resources availability due to potential changes in migration patterns or distribution of resources. Changes to the landscape caused by project construction can influence wildlife population migration patterns and distribution through habitat loss, changes in habitat suitability, changes in habitat use, or reduced survival. In addition, the highway itself can become a barrier to resource migration patterns through design, such as steep embankments or retaining walls, or through resource injuries or mortality due to collisions. As stated above, the ADF&G Division of Subsistence does not believe any of the project's build alternatives would negatively impact subsistence resource availability (Fall 2005).

The proposed build alternatives will not adversely affect the distribution or migration patterns of fish resources, so there will be no impact to subsistence uses. No structures would be placed that would block or impede fish passage.

Wildlife resource availability may be adversely affected as a result of potential changes to migration patterns resulting from each of the proposed reasonable alternatives. The Cooper Landing area has been identified as a brown bear movement area, with areas just west of Cooper Landing near Juneau Creek identified as primary brown bear habitat. However, brown bear is not a key subsistence species. Other movement areas have been identified in the project area for moose as well as other mammals, although impacts to movement of these resources are likely to be minor.

The new highway segments may fragment habitat by impeding access to sections of habitat, which would change migration movements. Physical features of the highway, such as steep embankments and retaining walls, may create barriers to wildlife movement and result in less use of the existing range. Increased noise levels in areas adjacent to new highway alignment segments could also impact normal wildlife distribution through the avoidance or reduced use of existing habitat within the project area. Changes in the use of existing habitat may alter the population distribution and may result in less habitat availability and reduced population size. Impacts to wildlife movement patterns and distribution are discussed in detail in Section 3.22

(Wildlife) of the SEIS. Negligible to minor impacts on wildlife resource distribution or movement from the build alternatives would not likely result in any impacts on subsistence uses.

It should be noted that DOT&PF is sponsoring a wildlife movement study steered by wildlife management agencies that is expected to aid in the design of underpasses and other measures to accommodate wildlife movement for brown bears and moose, as well as for other mammals. In addition, DOT&PF has committed to building underpasses on USFS roads that could function, in part, as wildlife crossings. While these underpasses are not intended specifically for wildlife crossings, DOT&PF is committed to building these structures to wildlife crossing standards so that moose and bears would be able to cross under the new highway at these locations.

5.1.2.3 Cumulative Case

As discussed in Section 5.1.1.6, subsistence was determined to have inconsequential impacts in association with the No Build and four build alternatives and was not identified as a national, regional, or local issue of importance (see Section 3.27.3, Cumulative, of the SEIS). The SEIS has found that the alternatives would not alter the availability of subsistence resources due to changes in distribution or migration patterns. While the No Build Alternative would not result in any new construction in the project area, ongoing operations and maintenance activities associated with the Sterling Highway Maintenance and Bridge Program would occur, potentially resulting in short-term construction-related impacts to fish and wildlife distribution and migration patterns. The limits of construction for the replacement of bridges and curve realignment for these actions have not yet been determined; therefore, specific impacts to subsistence resources and harvests during construction have not been determined. However, these impacts are expected to result in negligible to minor impacts on subsistence uses.

5.1.3 Physical or Legal Barriers to Accessing Resources

It should be noted that customary and traditional subsistence uses on federal lands would continue as authorized by Federal law under all reasonable alternatives. However, agencies would continue to monitor resource habitat and populations and alter hunting and fishing regulations to maintain resources at sustainable levels.

5.1.3.1 No Build Alternative

The No Build alternative would not cause new direct effects to accessing subsistence resources due to physical or legal barriers. However, as traffic levels, human population, and recreation increases, increased impacts to resources and habitats, as well as increased competition for resources between subsistence users and sport or personal use harvesters, may result in changes to harvest regulations or closures.

5.1.3.2 All Build Alternatives

No boat launches would be permanently affected, and access to the Kenai River would remain unchanged from existing conditions, under the build alternatives.

Several access areas (trailheads) to federal lands would be affected as a result of the proposed build alternatives. Adding new trailheads or improving existing trailheads could improve access to subsistence resource areas, but these new or improved trailheads are not expected to be

barriers to resources. In addition, for each of the build alternatives, DOT&PF has committed to building underpasses on USFS roads that would preserve access rights for subsistence users.

Increased access to previously inaccessible or difficult-to-access areas could introduce an increase in competition for unregulated subsistence resources. Unregulated wild resources (e.g., berries, eggs, or wood) could potentially be over-harvested in areas receiving higher levels of usage and could result in land managers needing to introduce regulations to better manage those wild resources and/or trailheads or areas used for collecting subsistence resources.

The availability of land for subsistence use also could be impacted because target species likely would not spend time near the new highway alignments except to cross them. Also, State law prohibits discharging firearms on, from, or across a road, and it is advised that hunters should discharge firearms well away from roads as a matter of safety and courtesy (ADF&G 2013). This law could deter hunting on Federal land with firearms in an approximate half-mile wide swath along each alternative, with the Juneau Creek alternatives creating the most new restriction, followed by the G South Alternative and the Cooper Creek Alternative.

5.1.3.3 Cumulative Case

As discussed in Section 5.1.1.6, subsistence was determined to have inconsequential impacts in association with the No Build and four build alternatives and was not identified as a national, regional, or local issue of importance (see Section 3.27.3, Cumulative, of the SEIS). The SEIS has found that the alternatives would not alter the availability of subsistence resources due to changes in access due to physical or legal barriers. While the No Build Alternative would not result in any new construction in the project area, ongoing operations and maintenance activities associated with the Sterling Highway Maintenance and Bridge Program would occur, potentially resulting in short-term construction-related impacts to access. However, these impacts are expected to result in negligible to minor impacts on subsistence uses.

5.2 The Availability of Other Lands, and Alternatives for the Purpose Sought to be Achieved

The purpose of the proposed project is to upgrade and expand the Sterling Highway in the Cooper Landing area (MP 45 to 60) to meet current design standards for rural principal arterial roads. The DOT&PF had originally identified 10 preliminary build alternatives to address transportation improvement needs in this area. The 10 preliminary alternatives underwent extensive evaluation including consistency with purpose and need, and other factors including physical and social environmental considerations, transportation factors, life cycle costs, and other feasibility considerations.[5] Those 10 preliminary alternatives have been reduced to five, including the No Build Alternative and four build alternatives determined to be reasonable. These reasonable alternatives best achieve the purpose and need for capacity and demand, current design standards, and system linkage. Because the purpose of the proposed project is to upgrade and expand the existing Sterling Highway, and because constructing and operating new highway outside of the project area could lead to greater adverse environmental impacts and

[5] . For more detail on the alternatives screening evaluation process and documents, see the project website at http://www.sterlinghighway.net/documents.html#alternativestwo.

engineering obstacles, lands outside of the proposed project area would not satisfy the purpose and need of the proposed project.

5.3 Other Alternatives that would Reduce or Eliminate the Use, Occupancy, or Disposition of Public Lands Needed for Subsistence Purposes

Other alternatives that would reduce or eliminate the use of Federal public lands needed for subsistence purposes are described in Chapter 2 of the SEIS. DOT&PF originally identified 10 preliminary build alternatives to address transportation improvement needs in the project area. Many of these alternatives were considered but eliminated from further analysis because they did not meet the purpose and need of the proposed project to provide for capacity and demand, current design standards, and system linkage; they could lead to greater adverse impacts on the environment; or they presented construction or operational limitations. Chapter 2 of the EIS provides a description of the alternatives eliminated from the study as well as the reasons for the elimination of these alternatives. The terrain restrictions and extent of Federal public land in the project area preclude other reasonable alternatives that would avoid or further minimize use of Federal public land.

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6 Summary of Findings

Based on available data on subsistence use within the project area by residents of the rural communities of Cooper Landing, Hope, and Ninilchik, the potential impacts to fish and wildlife subsistence resources are thought to be minimal for the reasonable alternatives for the Sterling Highway MP 45–60 project. The data examined provides an understanding of how federal lands and waters in the project area have been utilized by residents of these communities. The various ADF&G subsistence surveys document the important role of these resources in the diets of rural residents in the project area.

The documents referenced in this study quantify fish and wildlife resource harvests taken under both Federal subsistence regulations and State regulations. Based on the 1990 household survey findings, salmon were the most important resource harvested by residents of Cooper Landing and Hope. However, based on the 1990 and 2002 surveys, the majority of salmon harvested by Cooper Landing and Hope residents were under State sport fishing regulations and not under Federal subsistence regulations (Seitz et al. 1992; Fall et al. 2004). While Ninilchik residents harvested a larger percentage of salmon by means of subsistence methods, residents fished primarily in areas located outside of the project area (Fall et al. 2004). Based on the 1990 and 1998 surveys, wildlife, especially moose, has played an important role in the diets of Cooper Landing, Hope, and Ninilchik residents (Seitz et al. 1992; Fall et al. 2000). However, locations of wildlife harvests have not been well documented.

In addressing the evaluation criteria listed in Section 5, it is unlikely that a significant reduction of harvestable resources in subsistence use areas would occur due to competition with other subsistence users or sport or personal use hunting and fishing. Fish and wildlife resource populations will likely not be substantially affected by the increased access to subsistence use areas as a result of any of the alternatives. Fish resource distributions will likely be unaffected by implementation of any of the alternatives.

In general, the build alternatives are unlikely to have a measureable effect on subsistence resources, habitat, or competition. Any impacts would not be significant relative to the overall availability of habitat and subsistence use areas in the project area.

A finding that the proposed action could significantly restrict subsistence uses would require that additional requirements be imposed. However, this evaluation concludes, for reasons described in this document, that the effects of the proposed project fall below the level of significantly restricting subsistence uses for the rural communities of Cooper Landing, Hope and Ninilchik. Impacts to subsistence resources (population, distribution, and migration patterns), resource habitat, competition for resources, and user access would be minimal. Because no significant restriction of subsistence uses is anticipated, specific notice and hearings related to subsistence are not required by ANILCA [per Section 810(a)(3)]. However, because this project involves an EIS, notice to the public and agencies about the project as a whole will take place, and a hearing will be held [per Section 810(a) and 810(b)].

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Map 1: Subsistence Overview Map

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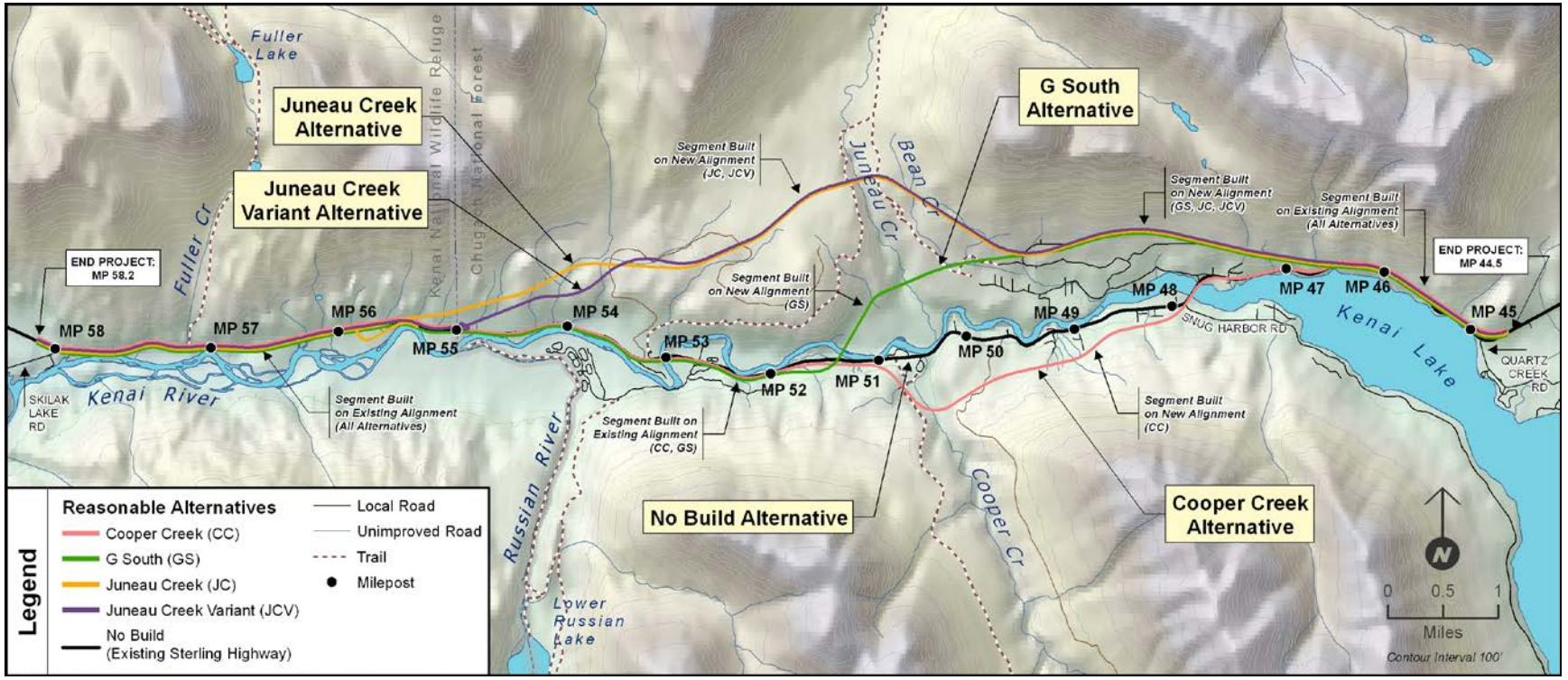

Map 2: Reasonable Alternatives

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Appendix D
Highway Traffic Noise Assessment

Prepared for:

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EXECUTIVE SUMMARY

The Alaska Department of Transportation and Public Facilities (DOT&PF) proposes to improve traffic movement through the Sterling Highway corridor between Mileposts 45 and 60. Four build alternatives are being considered, as well as a No Build option. This highway traffic noise assessment evaluates the potential for traffic noise impacts and noise mitigation options in accordance with the DOT&PF *Noise Policy*, dated April 2011.

Traffic noise levels were measured at eleven representative locations in the project area. Vehicle counts and classifications were performed at eight of these sites for use in validating the Federal Highway Administration (FHWA) Traffic Noise Model version 2.5 (TNM). Noise levels at the three additional sites were used to indicate ambient background levels at sites not directly adjacent to the existing highway. The FHWA TNM was used to predict and evaluate traffic noise levels at representative receptor points (noise prediction sites) under the existing condition, the four future Build alternatives, and the future No Build alternative. This traffic noise analysis conforms to FHWA and DOT&PF traffic noise analysis guidelines and requirements.

Table A shows a summary of the noise analysis results. The evaluation of the build alternatives yielded one noise impact at a commercial receptor, four noise impacts at residential receptors, and two noise impacts at recreational site receptors under the Cooper Creek Alternative; two noise impacts at recreational site receptors under the G South alternative; one noise impact at a recreational site receptor under the Juneau Creek Alternative; and one noise impact at a recreational site receptor under the Juneau Creek Variant Alternative. No feasible mitigation options were available for the noise impacts; consequently, no noise abatement is proposed as a part of the project.

Table A: Summary of Predicted Noise Impacts

NAC Class	Receptor Types		2012 Existing	2043 No Build	2043 Cooper Creek	2043 G South	2043 Juneau Creek	2043 Juneau Creek Variant
B	Residential	Meets or Exceeds NAC	1	4	4	0	0	0
		Substantial Increase	-	0	0	0	0	0
C	Campsite, Recreational areas, trails	Meets or Exceeds NAC	1	1	1	1	0	0
		Substantial Increase	-	0	1	1	1	1
E	Commercial	Meets or Exceeds NAC	0	0	1	0	0	0
		Substantial Increase	-	0	0	0	0	0
Total Number of Properties Impacted			**2**	**5**	**7**	**2**	**1**	**1**

This recommendation is based upon preliminary design information and existing policies. The recommendations will be re-evaluated during the design phase of the project to determine if they remain valid and conform to any changes in DOT&PF noise guidance.

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1.0 Introduction

The Sterling Highway connects the western Kenai Peninsula to the rest of Alaska, and the Alaska Department of Transportation and Public Facilities (DOT&PF) has recognized the need to resolve several interrelated problems:

- The highway's capacity is not adequate to accommodate through traffic.
- Physical highway design features do not conform to "Rural Principal Arterial" standards.
- Local traffic cannot efficiently move on and off the highway.

The project purpose is to resolve these problems, thereby reducing congestion and providing for more consistent flow of traffic at typical highway speeds, while also accommodating the sizable minority of traffic bound for local destinations.

This report and its recommendations will be re-evaluated during the design phase of the project to reflect any updates to DOT&PF traffic noise abatement guidance.

1.1 Project Alternatives

Four alternatives are being evaluated as part of the Supplemental Environmental Impact Statement (SEIS) currently under preparation. Each alternative begins at the intersection of Quartz Creek Road with the Sterling Highway, at MP 45, and ends just east of the highway's intersection with Skilak Lake Road, at MP 58. A brief description of each alternative is presented below.

1.1.1 *No Build Alternative*

The No Build Alternative will not change the existing highway in the project area. The existing highway has one lane in each direction, limited shoulder space, tight curves, limited sight distance, and a posted speed limit of 35 miles per hour (mph) in areas. Although normal highway maintenance would continue along this segment of roadway, no improvements would occur. The existing bridges along the Sterling Highway will be replaced as part of the normal bridge replacement program, but would not be conducted as part of this project.

1.1.2 *Cooper Creek Alternative*

The Cooper Creek Alternative follows the existing Sterling Highway from MP 45 to the south side of the Cooper Landing Bridge, where it turns south from the existing highway and climbs the hillside to a maximum elevation of approximately 275 feet above the Kenai River. The alignment traverses the hillside before descending to cross Cooper Creek with an 846-foot-long curved bridge. The alternative rejoins the existing Sterling Highway corridor at MP 51.3. The length of the alternative, including those areas that overlap with the existing highway, would be widened to meet current standards and would include the addition of west- and east-bound passing lanes. The Cooper Landing Bridge would be replaced with a new bridge that would be 78 feet wide and 670 feet long, and would accommodate 2 lanes, 1 turning lane, and 1 center lane, as well as shoulders and a pedestrian walkway on the downstream side. The existing

Schooner Bend Bridge would be replaced with a similar structure located approximately 80 feet downstream.

Due to the terrain surrounding the alternative, frequent rock and soil cuts are necessary, with the largest cut on the east side of the Cooper Creek Bridge being 1,500 feet long and 180 feet high.

1.1.3 *G South Alternative*

The G South Alternative uses the existing highway corridor at both ends of the project area, with a new alignment north of the Kenai River between MP 46.3 and MP 51.9. In areas where the G South Alternative occupies the footprint of the existing highway, the roadway will be widened to meet Rural Principal Arterial standards, and would include west-and eastbound passing lanes. The G South Alternative departs from the existing highway alignment at approximately MP 46 and gradually climbs to a maximum elevation of 776 feet on the hillside north of Bean Creek, where it then descends to cross Juneau Creek Canyon. The Juneau Creek Canyon Bridge would be 1,326 feet long and 62 feet wide with 2 lanes, an additional eastbound climbing lane, shoulders on both sides of the road, and a walkway on the south side of the bridge. On the west side of Juneau Creek Canyon, the alternative flattens to a new crossing of the Kenai River shortly before rejoining the existing highway corridor at MP 51.9. The new Kenai River Bridge would be a minimum of 486 feet long and 78 feet wide, with 2 lanes, an additional eastbound climbing lane, a center turn lane, shoulders on both sides of the road, and a walkway on the upstream side of the bridge. The Schooner Bend Bridge would be replaced as part of the G South Alternative, in the same manner described for the Cooper Creek Alternative.

1.1.4 *Juneau Creek Alternative*

The Juneau Creek Alternative would straighten and widen the existing highway at both ends of the project area, with a new alignment north of the existing roadway between approximately MP 46.3 and 55.8. The alternative diverges from the existing highway at MP 46.3 and climbs the hillside to its crossing of the Juneau Creek Canyon with a new bridge (830 to 1,650 feet long, depending on the bridge type selected). The new Juneau Creek Canyon Bridge would be 62 feet wide with two traffic lanes, one additional westbound climbing lane, shoulders on both sides of the road, and a pathway on the downstream (south) side of the bridge. Based on the conceptual alignment and profile for this alternative, Juneau Creek is approximately 230 feet below the canyon rim and approximately 425 feet from rim to rim of the canyon at the crossing.

On the west side of the canyon, the alignment continues to climb to its maximum elevation of approximately 300 feet above the Juneau Creek Canyon floor. The existing highway would be reconfigured to provide a T-intersection connection with the Juneau Creek Alternative at approximately MP 55.8 of the existing highway. The alignment then follows the existing highway for the remaining three miles to the end of the project.

1.1.4.1 Juneau Creek Variant Alternative

Juneau Creek Variant Alternative diverges from the Juneau Creek Alternative west of the Juneau Creek crossing. This alternative traverses the valley slope and merges with the existing Sterling Highway on the east side of the KNWR Wilderness boundary to avoid impacts to designated Wilderness. Access to Sportsman's Landing and the existing highway is provided by a loop to

the east under the Juneau Creek Variant as it nears the existing highway, intersecting the existing highway at the east end of Sportsman's Landing. Modifications to Sportsman's Landing entrance would be required to support this concept, but the property would not lose acreage.

1.2 Purpose of this Report

A traffic noise assessment was completed for the proposed Sterling Highway Milepost 45 to 60 SEIS Project to identify existing and predicted future traffic noise levels. Noise mitigation was evaluated where future traffic noise levels were predicted to approach or exceed the FHWA and DOT&PF Noise Abatement Criteria (NAC).

This noise assessment is in compliance with the FHWA noise abatement regulations in the U.S. Code of Federal Regulations 23 C.F.R. § 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*. This assessment is also in compliance with the DOT&PF *Noise Policy* dated April 2011, which describes the implementation of the FHWA noise regulations in Alaska.

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2.0 Methodology to Analyze Traffic Noise Levels and Define Traffic Noise Impacts

Noise is measured in decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more or less "weight." The A-weighted scale corresponds to the sensitivity range for human hearing. Noise levels are measured in dBA, the A-weighted sound level in decibels. When noise levels change 3 dBA or less, the change is considered to be barely perceptible to an adult with normal hearing in an outdoor setting. A 5 dBA change in noise level is clearly noticeable. A 10 dBA change in noise levels is perceived as a doubling or halving of noise loudness, and a 20 dBA change is considered a dramatic change in loudness. Table 1 shows noise levels associated with common, everyday sources, and helps the reader more fully understand the magnitude of noise levels discussed in this report.

The hourly equivalent noise level [Leq(h)] is used to analyze traffic noise levels and identify noise impacts. The Leq(h) is defined as the equivalent steady-state sound level which, in a stated period of time, contains the same acoustic energy as the time-varying sound level during the same period. Therefore, for the purposes of this analysis, Leq can be considered the average sound level, and Leq(h) can be considered the average sound level occurring over a one-hour period. It is representative of the overall (average) traffic-generated noise level expressed on an hourly basis.

Table 1: Common Noise Sources and Levels

Sound Pressure Level (dBA)	Typical Sources
120	Jet aircraft takeoff at 100 feet
110	Same aircraft at 400 feet
90	Motorcycle at 25 feet
80	Garbage disposal
70	City street corner
60	Conversational speech
50	Typical office
40	Living room (without TV)
30	Quiet bedroom at night

SOURCE: Environmental Impact Analysis Handbook, ed. by Rau and Wooten, 1980

Land uses are assigned to an activity category based on the type of activities occurring in each respective land use (e.g., residences, recreational areas, churches, commercial land, and undeveloped land). Activity categories are then ordered based on their sensitivity to traffic noise levels. NAC are assigned to each activity category. These NAC represent the maximum traffic noise levels that allow uninterrupted use within each activity category. Table 2 lists the seven

land use categories included in the NAC, and the Leq(h) associated with each activity category. Traffic noise impacts are identified relative to the NAC and the DOT&PF *Noise Policy*.

Table 2: FHWA Noise Abatement Criteria

Activity Category	Leq(h)	Description of Activity Category
A	57 dBA (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 dBA (Exterior)	Residential.
C	67 dBA (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 dBA (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 dBA (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F.
F	None	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	None	Undeveloped lands that are not permitted.

SOURCE: Federal Highway Administration regulations 23 CFR 772, Table 1
[1] Includes undeveloped lands permitted for this activity category.

The noise analysis modeled noise levels at receptors in the project area for Activity Category B (residential), Activity Category C (trails, campgrounds, and recreational areas), and Activity Category E (commercial).

The FHWA definition of a traffic noise impact (23 C.F.R. § 772) contains two criteria. Only one criterion has to be met to be considered an impact. Traffic noise impacts are defined as impacts that occur when the predicted traffic noise levels:

- approach or exceed the noise abatement criteria given on Table 2 (DOT&PF defines "approach" – see below); or,
- when the predicted traffic noise levels substantially exceed the existing noise levels (DOT&PF defines "substantially exceed" – see below).

The DOT&PF defines "approach" the NAC as within 1 dBA of the NAC (DOT&PF, 2011). Consequently a traffic noise impact would occur when noise levels at Activity Category B and C land uses are greater than or equal to 66 dBA and Activity Category E land uses are greater than or equal to 71 dBA. The DOT&PF *Noise Policy* defines a substantial increase in noise levels as a 15 dBA increase over existing noise levels.

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3.0 Noise Prediction Method

Traffic noise levels estimated for this study reflect "peak hour" volume noise levels and are predicted as Leq(h) in terms of dBA. The FHWA TNM was used to predict traffic noise levels. TNM is a three-dimensional computer model that calculates traffic noise levels using the following types of information:

- Vehicle mix and volume, using five default vehicle types;
- Vehicle speeds;
- Roadway geometry;
- Receptor locations; and
- Ground cover types and topographic terrain between roadway and receptors.

3.1 Traffic Parameters

Table 3 shows the traffic mix determined for this project. The vehicle mix used in this analysis was estimated for July from the DOT&PF Traffic Volume Report 2006-2008 data "E of Quartz Creek Road" location.

Table 3: Vehicle Mix

Roadway	Cars	Medium Trucks/RVs	Heavy Trucks	Buses	Motorcycles	Total
Sterling Hwy	80.7%	15.7%	3.3%	0.1%	0.2%	100%

Traffic volumes used in this analysis were published in the 2013 Traffic Study Update (Lounsbury & Associates, 2013). They are based on the 100th hour volumes calculated for the existing and proposed roadway segments (a 1% annual growth rate was used to estimate 2043 traffic volumes). Table 4 shows the breakdown of traffic volumes used to model both the Build and No Build alternatives. The roadway segments are defined based on highway mileposts and station numbers. Figure 1 shows the location of each highway segment used in the traffic and highway noise analysis. Traffic flow along the highway has a peak hour directional split of 67 percent eastbound and 33 percent westbound, which is depicted in the numbers reported in Table 4.

This analysis modeled one traffic lane in each direction with a pavement width of 12 feet (No Build and existing segments used 11 feet) and the TNM default pavement type. Traffic was modeled using an average speed of 45 or 55 mph, depending on the roadway.

Table 4: Vehicle Volume and Classification Data Used in TNM

Roadway Segment(s)	Cars	Medium Trucks	Heavy Trucks	Buses	Motorcycles	Total
2012 Existing Condition						
Segment 1 EB/WB	304/150	59/29	12/6	0/0	1/0	377/185
Segments 2–5 EB/WB	315/155	61/30	13/6	0/0	1/0	391/192
Segment 6 EB/WB	328/162	64/31	13/7	0/0	1/0	407/200
2043 No Build Alternative						
Segment 1 EB/WB	414/204	81/40	17/8	1/0	1/1	513/253
Segments 2–5 EB/WB	429/211	84/41	18/9	1/0	1/1	532/262
Segment 6 EB/WB	447/220	87/43	18/9	1/0	1/1	553/273
2043 Juneau Creek Alternative/ Juneau Creek Variant						
Segment 1 EB/WB	414/204	81/40	17/8	1/0	1/1	513/253
Segments 2–5 EB/WB	306/151	60/29	13/6	0/0	1/0	379/187
Segment 6 EB/WB	447/220	87/43	18/9	1/0	1/1	553/273
2043 G South Alternative						
Segment 1 EB/WB	414/204	81/40	17/8	1/0	1/1	513/253
Segment 2 EB/WB	429/211	84/41	18/9	1/0	1/1	532/262
Segments 3–5 EB/WB	306/151	60/29	13/6	0/0	1/0	379/187
Segment 6 EB/WB	447/220	87/43	18/9	1/0	1/1	553/273
2043 Cooper Creek Alternative						
Segment 1 EB/WB	414/204	81/40	17/8	1/0	1/1	513/253
Segment 2 EB/WB	429/211	84/41	18/9	1/0	1/1	532/262
Segments 3–4 EB/WB	301/148	58/29	12/6	0/0	1/0	373/183
Segment 5 EB/WB	429/211	84/41	18/9	1/0	1/1	532/262
Segment 6 EB/WB	447/220	87/43	18/9	1/0	1/1	553/273

3.2 Adjacent Land Use

Land uses throughout the project area vary between Activity Category B (residential) and Activity Category E (commercial) along the existing highway alignment, with Activity Category C (wilderness areas, campgrounds, trails and recreational areas) further from the existing highway alignment.

4.0 Existing Traffic Noise Levels and Validation

On July 13, 15, and 20, 2001, between the hours of 11 am and 11 pm, noise sampling was conducted at multiple locations in the project area (see NM sites on Figure 2 in Appendix B). The monitoring activities were scheduled to occur during peak travel times, which historically have been during a July weekend. A Larson Davis Model 820 sound level meter was used to collect noise monitoring data.

Existing traffic noise levels were measured at eight sites (sites NM1 through NM8) close to the existing highway and were compared against TNM predictions to verify the accuracy of the computer model. If the predicted and measured levels are within + or – 3 dBA of one another, the model is considered to be within the accepted level of accuracy.

Three additional measurements (sites A, B and C) were taken at locations remote from the existing highway to determine ambient background levels at locations where highway noise is not a significant source of ambient noise.

Meteorological data is presented here for informational purposes, and also to comply with FHWA highway noise analysis guidelines. Ambient temperatures were in the mid fifties (°F) during the first two sampling days and 60°F on July 20. Winds were calm, and there was no precipitation during the monitoring periods. The roadway surface was dry during noise monitoring, as required by FHWA traffic noise monitoring guidelines.

4.1 Field Measurements and Model Validation Results

The measured and predicted noise levels for each of the noise monitoring locations used for TNM validation are presented in Table 5. The difference between the measured and predicted noise levels at each location ranged from -0.1 dBA (under predicted) to +4.5 dBA (over predicted). Comparison of the measured and predicted noise levels revealed that TNM over predicted noise levels 75 percent of the time by an average value of 2.7 dBA. The general over prediction could be the result of a higher modeled traffic speed relative to actual conditions.

For the purposes of model validation, one decimal place is shown. For the remainder of this report and subsequent discussion, noise levels are reported as whole numbers.

Table 5: Ambient Monitoring and Model Validation Results

Monitoring Location	Location	Leq(h) (dBA)		
		Measured	Predicted	Difference
NM1	Russian River Ferry Parking Lot	55.7	56.9	1.2
NM2	Upper Russian R. Campground parking lot	41.8	43.6	1.8
NM3	Russian R. Campground overflow lot	61.5	61.4	-0.1
NM4	Across road from Gwin's Lodge	63.0	67.5	4.5
NM5	Upper Caribou Heights Road	40.9	44.5	3.6
NM6	Access trail below private residence	43.8	46.2	2.4
NM7	D. Young Ballfield, Cooper Landing	43.3	43.3	0.0
NM8	Kenai River boat ramp parking lot	55.7	58.2	2.5

All but two of the receptors were found to be within the acceptable 3 dBA tolerance range. The discrepancy at receptors NM4 and NM5 is likely due to two factors; actual traffic was slightly less than predicted peak hour volumes, and the actual speeds were less than the posted speed utilized in prediction. Because of the good correlation between predicted and actual noise levels at the other sites, no adjustment factors were utilized to adjust the model at NM4 and NM5.

Table 6 shows ambient noise levels measures at sites A, B and C which are presented to give an indication of ambient noise levels in the project area at sites further from the existing highway alignment, and where highway noise is not the dominant source of ambient noise.

Table 6: Ambient Levels Measured Away from Sterling Highway

Monitoring Location	Location	Leq(h) (dBA)
A	West Juneau Creek Road	40
B	Resurrection Trail, Juneau Creek bridge	65
C	Opposite Cooper Creek South Campground	61

Sites B and C were located close to creeks (Juneau Creek and Cooper Creek, respectively) and reflect higher ambient noise levels from the sound of rushing water in the creeks. Site A was a forest location without significant contributions from water sources and therefore reflects more of the ambient baseline for undeveloped lands throughout the project study area.

For the purposes of characterizing noise levels in areas where existing traffic noise is not a significant source of ambient noise, the most conservative monitored level from Table 6 was used to represent existing ambient levels. This means that where sites are located more than 1,000 feet from the existing highway alignment, an existing Leq(h) noise level of 40 dBA was assumed. Similarly, under future conditions, where noise receptors are located more than 1,000 feet from the existing or proposed highway alignments, an ambient Leq(h) of 40 dBA is assumed based on ambient measurements in the project area.

5.0 Traffic Noise Prediction

FHWA traffic noise analysis guidelines specify that future traffic noise levels be estimated using an FHWA-approved traffic noise model. The currently approved FHWA model is TNM (version 2.5), which was used to calculate existing traffic noise levels and future traffic noise levels for all alternatives.

The following subsections summarize the results of the analysis for each alternative. Residential and commercial receptors are labeled numerically and identified in Figures 3 through 10 for the purposes of reporting predicted noise levels. Campsites, trails, recreational areas, and Department of Transportation Act (DOT Act) Section 4(f) sites modeled are coded, and their descriptions are summarized in Table 7.

Table 7: Description of campsites, trails, recreational areas, and Section 4(f) sites modeled

Receptor ID	Location
URR N	Upper Russian River Campground North
URR E	Upper Russian River Campground East
URR S	Upper Russian River Campground South
PK SE	Princess Kenai Lodge Southeast
PK SW	Princess Kenai Lodge Southwest
PK N	Princess Kenai Lodge North
CC N	Cooper Creek Campground North
CC S	Cooper Creek Campground South
RR	Russian River Campground
KNWR 1	Kenai National Wildlife Refuge - Wilderness
KNWR 2	Kenai National Wildlife Refuge
KNWR 3	Kenai National Wildlife Refuge – Russian River Ferry
SP 1	Sportsman's Landing
SP 2	Sportsman's Landing Bluff Top
KRSMA 1	Kenai River Special Management Area - River confluence
KRRA 2	Kenai River Recreation Area #2/Beginnings
KRRA 1	Kenai River Recreation Area #1
KRSMA 2	Kenai River Special Management Area - G South Crossing
JCRA 1	Juneau Creek Falls Recreation Area Campsite
JCRA 2	Juneau Falls Recreation Area – Falls Overlook
JCRA 3	Juneau Falls Recreation Area – Resurrection Pass National Recreation Trail
BCT 1	Bean Creek Trail near Juneau Creek alignment
BCT 2	Bean Creek Trail near G South alignment
ST 1	Stetson Trail #1
ST 2	Stetson Trail #2
CLBL	Cooper Landing Boat Launch

5.1 Existing Highway/No Build/ Cooper Creek Alternatives

Table 8 lists the noise sensitive receptors along the existing highway and the No Build and Cooper Creek alternatives. Included in the table are the predicted Leq(h) noise levels in terms of dBA for the existing highway (2012), No Build Alternative (2043), and Cooper Creek Alternative (2043), as well as their differences. The predicted noise levels are compared to the NAC, and levels that approach, meet or exceed the NAC are shown in bold type. Figures 3 through 10 show the location of the noise sensitive receptors along the existing highway, No Build, and Cooper Creek alternatives.

Table 8: Noise Analysis Results – Existing Highway/No Build/Cooper Creek Alternative

Receptor ID	Existing Land Use (FHWA Activity Category)	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No-Build Noise Level (dBA)	2043 Cooper Creek Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
1	Residential (B)	66	63	65	63	-2	0	No
2	Residential (B)	66	59	60	59	-1	0	No
3	Residential (B)	66	51	53	53	0	2	No
4	Residential (B)	66	54	55	51	-4	-3	No
5	Residential (B)	66	53	54	50	-4	-3	No
6	Residential (B)	66	57	59	54	-5	-3	No
7	Residential (B)	66	52	53	49	-4	-3	No
8	Residential (B)	66	49	51	47	-4	-2	No
9	Residential (B)	66	54	56	51	-5	-3	No
10	Residential (B)	66	56	58	53	-5	-3	No
11	Residential (B)	66	54	56	51	-5	-3	No
12	Residential (B)	66	51	52	48	-4	-3	No
13	Residential (B)	66	51	52	48	-4	-3	No
14	Residential (B)	66	62	64	59	-5	-3	No
15	Residential (B)	66	50	52	48	-4	-2	No
16	Residential (B)	66	61	63	57	-6	-4	No
17	Residential (B)	66	63	64	59	-5	-4	No
18	Residential (B)	66	56	58	53	-5	-3	No
19	Residential (B)	66	50	52	48	-4	-2	No
20	Residential (B)	66	51	53	48	-5	-3	No
21	Residential (B)	66	65	**66**	61	-5	-4	No

Receptor ID	Existing Land Use (FHWA Activity Category)	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No-Build Noise Level (dBA)	2043 Cooper Creek Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
22	Residential (B)	66	51	53	49	-4	-2	No
23	Residential (B)	66	55	56	51	-5	-4	No
24	Residential (B)	66	55	56	51	-5	-4	No
25	Residential (B)	66	55	56	51	-5	-4	No
26	Residential (B)	66	54	55	51	-4	-3	No
27	Residential (B)	66	60	61	56	-5	-4	No
28	Residential (B)	66	54	55	51	-4	-3	No
29	Residential (B)	66	52	54	50	-4	-2	No
30	Residential (B)	66	51	53	49	-4	-2	No
31	Residential (B)	66	51	52	49	-3	-2	No
32	Residential (B)	66	50	51	49	-2	-1	No
33	Residential (B)	66	43	45	54	9	11	No
34	Residential (B)	66	50	52	50	-2	0	No
35	Residential (B)	66	60	61	56	-5	-4	No
36	Residential (B)	66	58	59	54	-5	-4	No
37	Residential (B)	66	54	55	51	-4	-3	No
38	Residential (B)	66	46	49	53	4	7	No
39	Residential (B)	66	46	48	55	7	9	No
40	Residential (B)	66	59	60	55	-5	-4	No
41	Residential (B)	66	60	61	56	-5	-4	No
42	Residential (B)	66	49	52	50	-2	1	No
43	Residential (B)	66	47	49	52	3	5	No
44	Residential (B)	66	52	55	51	-4	-1	No
45	Residential (B)	66	52	53	49	-4	-3	No
46	Residential (B)	66	52	53	48	-5	-4	No
47	Residential (B)	66	52	53	49	-4	-3	No
48	Residential (B)	66	52	53	49	-4	-3	No
49	Residential (B)	66	55	56	51	-5	-4	No
50	Residential (B)	66	52	53	49	-4	-3	No

Receptor ID	Existing Land Use (FHWA Activity Category)	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No-Build Noise Level (dBA)	2043 Cooper Creek Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
51	Residential (B)	66	53	55	50	-5	-3	No
52	Residential (B)	66	60	61	56	-5	-4	No
53	Residential (B)	66	55	57	52	-5	-3	No
54	Residential (B)	66	63	64	59	-5	-4	No
55	Residential (B)	66	57	59	54	-5	-3	No
56	Residential (B)	66	53	55	52	-3	-1	No
57	Residential (B)	66	50	51	52	1	2	No
58	Residential (B)	66	49	50	54	4	5	No
59	Residential (B)	66	48	50	54	4	6	No
60	Residential (B)	66	48	50	54	4	6	No
61	Residential (B)	66	47	49	59	10	12	No
62	Residential (B)	66	53	54	52	-2	-1	No
63	Residential (B)	66	53	55	53	-2	0	No
64	Residential (B)	66	60	61	56	-5	-4	No
65	Residential (B)	66	62	63	58	-5	-4	No
66	Residential (B)	66	61	63	58	-5	-3	No
67	Residential (B)	66	61	63	58	-5	-3	No
68	Residential (B)	66	52	54	50	-4	-2	No
69	Residential (B)	66	53	54	51	-3	-2	No
70	Residential (B)	66	52	53	50	-3	-2	No
71	Residential (B)	66	50	52	50	-2	0	No
72	Residential (B)	66	53	54	51	-3	-2	No
73	Residential (B)	66	53	55	52	-3	-1	No
74	Residential (B)	66	59	60	56	-4	-3	No
75	Residential (B)	66	56	57	53	-4	-3	No
76	Residential (B)	66	59	61	56	-5	-3	No
77	Residential (B)	66	56	57	54	-3	-2	No
78	Residential (B)	66	61	62	57	-5	-4	No
79	Residential (B)	66	48	50	56	6	8	No

Receptor ID	Existing Land Use (FHWA Activity Category)	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No-Build Noise Level (dBA)	2043 Cooper Creek Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
80	Residential (B)	66	54	55	53	-2	-1	No
81	Residential (B)	66	57	59	55	-4	-2	No
82	Residential (B)	66	55	56	54	-2	-1	No
83	Residential (B)	66	49	50	55	5	6	No
84	Residential (B)	66	52	53	57	4	5	No
85	Residential (B)	66	55	56	59	3	4	No
86	Residential (B)	66	52	54	54	0	2	No
87	Residential (B)	66	56	58	**67**	9	11	**Yes**
88	Residential (B)	66	55	57	54	-3	-1	No
89	Residential (B)	66	55	57	55	-2	0	No
90	Residential (B)	66	60	61	58	-3	-2	No
91	Residential (B)	66	60	62	60	-2	0	No
92	Residential (B)	66	60	62	61	-1	1	No
93	Residential (B)	66	53	54	55	1	2	No
94	Residential (B)	66	53	54	58	4	5	No
95	Residential (B)	66	50	51	53	2	3	No
96	Residential (B)	66	50	52	54	2	4	No
97	Residential (B)	66	53	55	56	1	3	No
98	Commercial (E)	71	62	63	67	4	5	No
99	Residential (B)	66	51	53	54	1	3	No
100	Residential (B)	66	53	55	61	6	8	No
101	Residential (B)	66	53	54	55	1	2	No
102	Residential (B)	66	56	58	59	1	3	No
103	Residential (B)	66	59	61	62	1	3	No
104	Residential (B)	66	58	59	61	2	3	No
105	Residential (B)	66	64	**66**	**68**	2	4	**Yes**
106	Residential (B)	66	**69**	**70**	**72**	2	3	**Yes**
107	Commercial (E)	71	66	68	**71**	3	5	**Yes**
108	Residential (B)	66	52	54	56	2	4	No

Receptor ID	Existing Land Use (FHWA Activity Category)	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No-Build Noise Level (dBA)	2043 Cooper Creek Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
109	Commercial (E)	71	66	68	70	2	4	No
110	Commercial (E)	71	62	64	67	3	5	No
111	Commercial (E)	71	60	62	63	1	3	No
112	Residential (B)	66	58	60	61	1	3	No
113	Residential (B)	66	60	62	63	1	3	No
114	Residential (B)	66	59	60	62	2	3	No
115	Residential (B)	66	57	59	60	1	3	No
116	Residential (B)	66	59	60	59	-1	0	No
117	Residential (B)	66	56	58	56	-2	0	No
118	Residential (B)	66	57	59	57	-2	0	No
119	Residential (B)	66	65	**66**	**66**	0	1	**Yes**
120	Residential (B)	66	58	59	59	0	1	No
121	Residential (B)	66	58	60	58	-2	0	No
122	Residential (B)	66	59	61	58	-3	-1	No
123	Residential (B)	66	61	62	60	-2	-1	No
124	Residential (B)	66	59	60	60	0	1	No
125	Residential (B)	66	60	61	60	-1	0	No
126	Residential (B)	66	61	62	63	1	2	No
127	Residential (B)	66	58	59	61	2	3	No
128	Residential (B)	66	57	58	59	1	2	No
URR N	Campground (C)	66	44	46	46	0	2	No
URR E	Campground (C)	66	40[a]	40[a]	43	3	3	No
URR S	Campground (C)	66	40[a]	40[a]	39	-1	-1	No
PK SE	Campground (C)	66	44	45	46	1	2	No
PK SW	Campground (C)	66	40[a]	40[a]	46	6	6	No
PK N	Campground (C)	66	40[a]	40[a]	44	4	4	No
CC N	Campground (C)	66	54	55	52	-3	-2	No
CC S	Campground (C)	66	47	48	46	-2	-1	No
RR	Campground (C)	66	52	53	55	2	3	No

Receptor ID	Existing Land Use (FHWA Activity Category)	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No-Build Noise Level (dBA)	2043 Cooper Creek Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
KNWR 1	Recreation Area (C)	66	40[a]	40[a]	40	0	0	No
KNWR 2	Recreation Area (C)	66	48	50	50	0	2	No
KNWR 3	Recreation Area (C)	66	45	47	47	0	2	No
SP 1	Recreation Area (C)	66	59	60	59	-1	0	No
SP 2	Recreation Area (C)	66	59	60	60	0	1	No
KRSMA 1	Recreation Area (C)	66	51	52	52	0	1	No
KRRA 2	Recreation Area (C)	66	**67**	**68**	**68**	0	1	**Yes**
KRRA 1	Recreation Area (C)	66	40[a]	40[a]	46	6	6	No
KRSMA 2	Recreation Area (C)	66	49	50	50	0	1	No
JCRA 1	Campground (C)	66	40[a]	40[a]	33	-7	-7	No
JCRA 2	Recreation Area (C)	66	40[a]	40[a]	33	-7	-7	No
JCRA 3	Trail (C)	66	40[a]	40[a]	34	-6	-6	No
BCT 1	Trail (C)	66	40[a]	40[a]	34	-6	-6	No
BCT 2	Trail (C)	66	40[a]	40[a]	39	-1	-1	No
ST 1	Trail (C)	66	40[a]	40[a]	56	16	**16**	**Yes**
ST 2	Trail (C)	66	40[a]	40[a]	46	6	6	No
CLBL	Recreation Area (C)	66	54	55	56	1	2	No

[a] Sites located in areas where traffic noise is not a significant contributor to existing ambient noise levels were characterized using measured ambient levels as described in Section 4.1.

The results for the existing condition predict that peak noise levels at modeled receptors would range from 40 to 69 dBA. One residential receptor (106) and one recreational receptor (KRRA 2) are predicted to have noise impacts under the existing condition. Results for the No Build Alternative predict that peak noise levels at modeled receptors would range from 40 to 70 dBA. Changes in noise levels between the existing condition and the No Build Alternative at specific receptors range from no change to an increase of 3 dBA, and are due to changes in traffic volumes predicted to occur between 2012 and 2043. Four residential receptors (21, 105, 106 and R119) and one recreational receptor (KRRA 2) are predicted to have noise impacts under the No Build Alternative.

Under the Cooper Creek Alternative, noise levels at modeled receptors are predicted to be between 33 and 72 dBA. In cases where predicted future Build Alternative noise levels are

estimated to be below 40 dBA for receptors (JCRA 1, JCRA 2, JCRA 3, BCT1, and BCT2) that have existing and No Build noise levels assumed to be at 40 dBA from ambient measurement data (see Section 5.1), actual future levels may not be as low as predicted. The low modeled results for these locations indicates that the highway would likely have little or no effect on ambient noise levels due to the distance between the proposed highway alignment and the receptors. If existing ambient levels are around 40 dBA, as assumed, then those levels would likely prevail at these locations.

Changes in noise levels between the existing condition and the Build Alternative at specific receptors range from a decrease of 7 dBA to an increase of 16 dBA. Changes in noise levels between the No Build Alternative and the Build Alternative at specific receptors also range from a decrease of 7 dBA to an increase of 16 dBA. Changes in noise levels between the No Build and the Cooper Creek Alternative are due to changes in traffic volumes, changes in roadway alignments, and changes in shielding. Four residential properties (87, 105, 106, 119), one commercial properties (107), and one recreational site (KRRA 2) are predicted to have 2043 noise levels approaching, equal to, or above the NAC under the Cooper Creek Alternative. One trail site (ST1) is predicted to have a substantial increase impact in 2043 under the Cooper Creek Alternative.

5.2 G South Alternative

The G South alternative is located in mostly undeveloped land. Figures 3 through 10 show the location of the G South alignment and modeled receptors. Table 9 lists the noise analysis results for this alternative, which includes receptors along the existing alignment for comparison to the existing condition and No Build Alternative. Table 9 shows the computed noise levels in hourly Leq dBA for the existing highway traffic (2012), No Build Alternative (2043), and the G South Alternative (2043). The existing highway and the 2043 No Build Alternative results are compared to the 2043 Build Alternative results and the differences are shown. The computed noise levels are compared to the NAC. Bold font identifies levels that approach, meet, or exceed the NAC.

Under the G South Alternative, noise levels at modeled receptors are predicted to be between 34 and 68 dBA. In cases where predicted future Build Alternative noise levels are estimated to be below 40 dBA for receptors (JCRA 1, JCRA 2, JCRA 3, and BCT1) that have existing and No Build noise levels assumed to be at 40 dBA from ambient measurement data (see Section 4.1), actual future levels may not be as low as predicted. The low modeled results for these locations indicates that the highway would likely have little or no effect on ambient noise levels due to the distance between the proposed highway alignment and the receptors. If existing ambient levels are around 40 dBA, as assumed, then those levels would likely prevail at these locations.

Table 9: Noise Analysis Results –G South Alternative

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 G South Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
1	Residential (B)	66	63	65	63	-2	0	No
2	Residential (B)	66	59	60	59	-1	0	No
3	Residential (B)	66	51	53	53	0	2	No
4	Residential (B)	66	54	55	50	-5	-4	No
5	Residential (B)	66	53	54	49	-5	-4	No
6	Residential (B)	66	57	59	54	-5	-3	No
7	Residential (B)	66	52	53	48	-5	-4	No
8	Residential (B)	66	49	51	46	-5	-3	No
9	Residential (B)	66	54	56	51	-5	-3	No
10	Residential (B)	66	56	58	53	-5	-3	No
11	Residential (B)	66	54	56	51	-5	-3	No
12	Residential (B)	66	51	52	47	-5	-4	No
13	Residential (B)	66	51	52	47	-5	-4	No
14	Residential (B)	66	62	64	59	-5	-3	No
15	Residential (B)	66	50	52	47	-5	-3	No
16	Residential (B)	66	61	63	57	-6	-4	No
17	Residential (B)	66	63	64	59	-5	-4	No
18	Residential (B)	66	56	58	53	-5	-3	No
19	Residential (B)	66	50	52	47	-5	-3	No
20	Residential (B)	66	51	53	48	-5	-3	No
21	Residential (B)	66	65	**66**	61	-5	-4	No
22	Residential (B)	66	51	53	48	-5	-3	No
23	Residential (B)	66	55	56	52	-4	-3	No
24	Residential (B)	66	55	56	51	-5	-4	No
25	Residential (B)	66	55	56	51	-5	-4	No
26	Residential (B)	66	54	55	50	-5	-4	No
27	Residential (B)	66	60	61	56	-5	-4	No
28	Residential (B)	66	54	55	51	-4	-3	No
29	Residential (B)	66	52	54	49	-5	-3	No
30	Residential (B)	66	51	53	48	-5	-3	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 G South Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
31	Residential (B)	66	51	52	48	-4	-3	No
32	Residential (B)	66	50	51	47	-4	-3	No
34	Residential (B)	66	50	52	47	-5	-3	No
35	Residential (B)	66	60	61	56	-5	-4	No
36	Residential (B)	66	58	59	54	-5	-4	No
37	Residential (B)	66	54	55	50	-5	-4	No
40	Residential (B)	66	59	60	55	-5	-4	No
41	Residential (B)	66	60	61	56	-5	-4	No
42	Residential (B)	66	49	52	46	-6	-3	No
44	Residential (B)	66	55	56	49	-6	-3	No
45	Residential (B)	66	52	53	48	-5	-4	No
46	Residential (B)	66	53	55	48	-5	-4	No
47	Residential (B)	66	60	61	48	-5	-4	No
48	Residential (B)	66	55	57	48	-5	-4	No
49	Residential (B)	66	63	64	51	-5	-4	No
50	Residential (B)	66	57	59	48	-5	-4	No
51	Residential (B)	66	53	55	50	-5	-3	No
52	Residential (B)	66	50	51	56	-5	-4	No
53	Residential (B)	66	55	56	52	-5	-3	No
54	Residential (B)	66	52	53	59	-5	-4	No
55	Residential (B)	66	53	55	53	-6	-4	No
56	Residential (B)	66	60	61	50	-5	-3	No
57	Residential (B)	66	55	57	47	-4	-3	No
62	Residential (B)	66	53	54	50	-4	-3	No
63	Residential (B)	66	53	55	50	-5	-3	No
64	Residential (B)	66	60	61	56	-5	-4	No
65	Residential (B)	66	62	63	58	-5	-4	No
66	Residential (B)	66	61	63	57	-6	-4	No
67	Residential (B)	66	61	63	57	-6	-4	No
68	Residential (B)	66	52	54	49	-5	-3	No
69	Residential (B)	66	53	54	49	-5	-4	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 G South Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
70	Residential (B)	66	52	53	49	-4	-3	No
71	Residential (B)	66	50	52	47	-5	-3	No
72	Residential (B)	66	53	54	49	-5	-4	No
73	Residential (B)	66	53	55	50	-5	-3	No
74	Residential (B)	66	59	60	55	-5	-4	No
75	Residential (B)	66	56	57	52	-5	-4	No
76	Residential (B)	66	59	61	55	-6	-4	No
77	Residential (B)	66	56	57	52	-5	-4	No
78	Residential (B)	66	61	62	57	-5	-4	No
80	Residential (B)	66	54	55	50	-5	-4	No
81	Residential (B)	66	57	59	54	-5	-3	No
82	Residential (B)	66	55	56	52	-4	-3	No
83	Residential (B)	66	49	50	48	-2	-1	No
84	Residential (B)	66	52	53	50	-3	-2	No
85	Residential (B)	66	55	56	53	-3	-2	No
86	Residential (B)	66	52	54	50	-4	-2	No
87	Residential (B)	66	56	58	53	-5	-3	No
88	Residential (B)	66	55	57	52	-5	-3	No
89	Residential (B)	66	55	57	52	-5	-3	No
90	Residential (B)	66	60	61	56	-5	-4	No
91	Residential (B)	66	60	62	57	-5	-3	No
92	Residential (B)	66	60	62	57	-5	-3	No
93	Residential (B)	66	53	54	50	-4	-3	No
94	Residential (B)	66	53	54	50	-4	-3	No
95	Residential (B)	66	50	51	49	-2	-1	No
96	Residential (B)	66	50	52	49	-3	-1	No
97	Residential (B)	66	53	55	51	-4	-2	No
98	Commercial (E)	71	62	63	59	-4	-3	No
99	Residential (B)	66	51	53	50	-3	-1	No
100	Residential (B)	66	53	55	51	-4	-2	No
101	Residential (B)	66	53	54	51	-3	-2	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 G South Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
102	Residential (B)	66	56	58	54	-4	-2	No
103	Residential (B)	66	59	61	56	-5	-3	No
104	Residential (B)	66	58	59	55	-4	-3	No
105	Residential (B)	66	64	**66**	61	-5	-3	No
106	Residential (B)	66	**69**	**70**	65	-5	-4	No
107	Commercial (E)	71	66	68	63	-5	-3	No
108	Residential (B)	66	52	54	51	-3	-1	No
109	Commercial (E)	71	66	68	62	-6	-4	No
110	Commercial (E)	71	62	64	59	-5	-3	No
111	Commercial (E)	71	60	62	57	-5	-3	No
112	Residential (B)	66	58	60	55	-5	-3	No
113	Residential (B)	66	60	62	57	-5	-3	No
114	Residential (B)	66	59	60	56	-4	-3	No
115	Residential (B)	66	57	59	55	-4	-2	No
116	Residential (B)	66	59	60	55	-5	-4	No
117	Residential (B)	66	56	58	54	-4	-2	No
118	Residential (B)	66	57	59	56	-3	-1	No
119	Residential (B)	66	65	**66**	61	-5	-4	No
120	Residential (B)	66	58	59	55	-4	-3	No
121	Residential (B)	66	58	60	56	-4	-2	No
122	Residential (B)	66	59	61	57	-4	-2	No
123	Residential (B)	66	61	62	56	-6	-5	No
124	Residential (B)	66	59	60	60	0	1	No
125	Residential (B)	66	60	61	60	-1	0	No
126	Residential (B)	66	61	62	58	-4	-3	No
127	Residential (B)	66	58	59	56	-3	-2	No
128	Residential (B)	66	57	58	59	1	2	No
URR N	Campground (C)	66	44	46	46	0	2	No
URR E	Campground (C)	66	40[a]	40[a]	43	3	3	No
URR S	Campground (C)	66	40[a]	40[a]	39	-1	-1	No
PK SE	Campground (C)	66	44	45	42	-3	-2	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 G South Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
PK SW	Campground (C)	66	40[a]	40[a]	42	2	2	No
PK N	Campground (C)	66	40[a]	40[a]	42	2	2	No
CC N	Campground (C)	66	54	55	51	-4	-3	No
CC S	Campground (C)	66	47	48	44	-4	-3	No
RR	Campground (C)	66	52	53	55	2	3	No
KNWR 1	Recreation Area (C)	66	40[a]	40[a]	40	0	0	No
KNWR 2	Recreation Area (C)	66	48	50	50	0	2	No
KNWR 3	Recreation Area (C)	66	45	47	47	0	2	No
SP 1	Recreation Area (C)	66	59	60	59	-1	0	No
SP 2	Recreation Area (C)	66	59	60	60	0	1	No
KRSMA 1	Recreation Area (C)	66	51	52	52	0	1	No
KRRA 2	Recreation Area (C)	66	**67**	**68**	**68**	0	1	**Yes**
KRRA 1	Recreation Area (C)	66	40[a]	40[a]	46	6	6	No
KRSMA 2	Recreation Area (C)	66	49	50	54	4	5	No
JCRA 1	Campground (C)	66	40[a]	40[a]	34	-6	-6	No
JCRA 2	Recreation Area (C)	66	40[a]	40[a]	34	-6	-6	No
JCRA 3	Trail (C)	66	40[a]	40[a]	35	-5	-5	No
BCT 1	Trail (C)	66	40[a]	40[a]	35	-5	-5	No
BCT 2	Trail (C)	66	40[a]	40[a]	61	21	**21**	**Yes**
ST 1	Trail (C)	66	40[a]	40[a]	41	1	1	No
ST 2	Trail (C)	66	40[a]	40[a]	38	-2	-2	No
CLBL	Recreation Area (C)	66	54	55	51	-4	-3	No

[a] Sites located in areas where traffic noise is not a significant contributor to existing ambient noise levels were characterized using measured ambient levels as described in Section 4.1.

Changes in noise levels between the existing condition and the Build Alternative at specific receptors range from a decrease of 6 dBA to an increase of 21 dBA. Changes in noise levels between the No Build Alternative and the Build Alternative at specific receptors range from a decrease of 6 dBA to an increase of 21 dBA. Changes in noise levels between the No Build and the Build alternatives are due to changes in traffic volumes, changes in roadway alignments, and changes in shielding. One recreational site (KRRA 2) is predicted to have 2043 noise levels approaching, equal to, or above the NAC under the G South Alternative. One trail site (BCT 2) is predicted to have a substantial increase impact in 2043 under the G South Alternative.

5.3 Juneau Creek Alternative

The Juneau Creek Alternative is located in mostly undeveloped land. Figures 3 through 10 show the location of the Juneau Creek Alternative and modeled receptors. Table 10 lists the noise analysis results for the Juneau Creek Alternative, which includes receptors along the existing alignment for comparison to the existing highway and No Build Alternative. Table 10 shows the computed noise levels in hourly Leq dBA for the existing highway (2012), No Build Alternative (2043), and Juneau Creek Alternative (2043). The existing highway and the 2043 No Build Alternative results are compared to the 2043 Build Alternative results and the differences are shown. The computed noise levels are compared to the NAC. Bold font identifies levels that approach, meet, or exceed the NAC.

Under the Juneau Creek Alternative, noise levels at modeled receptors are predicted to be between 36 and 65 dBA. In cases where predicted future Build Alternative noise levels are estimated to be below 40 dBA for receptors (ST1 and ST2) that have existing and No Build noise levels assumed to be at 40 dBA from ambient measurement data (see Section 4.1), actual future levels may not be as low as predicted. The low modeled results for these locations indicates that the highway would likely have little or no effect on ambient noise levels due to the distance between the proposed highway alignment and the receptors. If existing ambient levels are around 40 dBA, as assumed, then those levels would likely prevail at these locations.

Changes in noise levels between the existing condition and the Juneau Creek Alternative at specific receptors range from a decrease of 5 dBA to an increase of 21 dBA. Changes in noise levels between the No Build Alternative and the Juneau Creek Alternative at specific receptors range from a decrease of 6 dBA to an increase of 21 dBA. Changes in noise levels between the No Build and the Juneau Creek Alternative are due to changes in traffic volumes, changes in roadway alignments, and changes in shielding. No receptors are predicted to have 2043 noise levels approaching, equal to, or above the NAC under the Juneau Creek Alternative. One trail site (BCT 1) is predicted to have a substantial increase impact in 2043 under the Juneau Creek Alternative.

Table 10: Noise Analysis Results –Juneau Creek Alternative

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 Juneau Creek Noise Level (dBA)	Change Between 2043 No Build and 2034 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
1	Residential (B)	66	63	65	59	-6	-4	No
2	Residential (B)	66	59	60	55	-5	-4	No
3	Residential (B)	66	51	53	48	-5	-3	No
4	Residential (B)	66	54	55	50	-5	-4	No
5	Residential (B)	66	53	54	49	-5	-4	No
6	Residential (B)	66	57	59	54	-5	-3	No
7	Residential (B)	66	52	53	48	-5	-4	No
8	Residential (B)	66	49	51	46	-5	-3	No
9	Residential (B)	66	54	56	51	-5	-3	No
10	Residential (B)	66	56	58	53	-5	-3	No
11	Residential (B)	66	54	56	51	-5	-3	No
12	Residential (B)	66	51	52	47	-5	-4	No
13	Residential (B)	66	51	52	47	-5	-4	No
14	Residential (B)	66	62	64	59	-5	-3	No
15	Residential (B)	66	50	52	47	-5	-3	No
16	Residential (B)	66	61	63	57	-6	-4	No
17	Residential (B)	66	63	64	59	-5	-4	No
18	Residential (B)	66	56	58	52	-6	-4	No
19	Residential (B)	66	50	52	47	-5	-3	No
20	Residential (B)	66	51	53	48	-5	-3	No
21	Residential (B)	66	65	**66**	61	-5	-4	No
22	Residential (B)	66	51	53	48	-5	-3	No
23	Residential (B)	66	55	56	51	-5	-4	No
24	Residential (B)	66	55	56	51	-5	-4	No
25	Residential (B)	66	55	56	51	-5	-4	No
26	Residential (B)	66	54	55	50	-5	-4	No
27	Residential (B)	66	60	61	56	-5	-4	No
28	Residential (B)	66	54	55	50	-5	-4	No
29	Residential (B)	66	52	54	49	-5	-3	No
30	Residential (B)	66	51	53	48	-5	-3	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 Juneau Creek Noise Level (dBA)	Change Between 2043 No Build and 2034 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
31	Residential (B)	66	51	52	48	-4	-3	No
32	Residential (B)	66	50	51	47	-4	-3	No
34	Residential (B)	66	50	52	47	-5	-3	No
35	Residential (B)	66	60	61	56	-5	-4	No
36	Residential (B)	66	58	59	54	-5	-4	No
37	Residential (B)	66	54	55	50	-5	-4	No
40	Residential (B)	66	59	60	55	-5	-4	No
41	Residential (B)	66	60	61	56	-5	-4	No
42	Residential (B)	66	49	52	46	-6	-3	No
44	Residential (B)	66	55	56	49	-6	-3	No
45	Residential (B)	66	52	53	48	-5	-4	No
46	Residential (B)	66	53	55	48	-5	-4	No
47	Residential (B)	66	60	61	48	-5	-4	No
48	Residential (B)	66	55	57	48	-5	-4	No
49	Residential (B)	66	63	64	51	-5	-4	No
50	Residential (B)	66	57	59	48	-5	-4	No
51	Residential (B)	66	53	55	50	-5	-3	No
52	Residential (B)	66	50	51	56	-5	-4	No
53	Residential (B)	66	55	56	52	-5	-3	No
54	Residential (B)	66	52	53	59	-5	-4	No
55	Residential (B)	66	53	55	53	-6	-4	No
56	Residential (B)	66	60	61	50	-5	-3	No
57	Residential (B)	66	55	57	47	-4	-3	No
62	Residential (B)	66	53	54	50	-4	-3	No
63	Residential (B)	66	53	55	50	-5	-3	No
64	Residential (B)	66	60	61	56	-5	-4	No
65	Residential (B)	66	62	63	58	-5	-4	No
66	Residential (B)	66	61	63	57	-6	-4	No
67	Residential (B)	66	61	63	57	-6	-4	No
68	Residential (B)	66	52	54	49	-5	-3	No
69	Residential (B)	66	53	54	49	-5	-4	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 Juneau Creek Noise Level (dBA)	Change Between 2043 No Build and 2034 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
70	Residential (B)	66	52	53	48	-5	-4	No
71	Residential (B)	66	50	52	47	-5	-3	No
72	Residential (B)	66	53	54	49	-5	-4	No
73	Residential (B)	66	53	55	50	-5	-3	No
74	Residential (B)	66	59	60	55	-5	-4	No
75	Residential (B)	66	56	57	52	-5	-4	No
76	Residential (B)	66	59	61	55	-6	-4	No
77	Residential (B)	66	56	57	52	-5	-4	No
78	Residential (B)	66	61	62	57	-5	-4	No
80	Residential (B)	66	54	55	50	-5	-4	No
81	Residential (B)	66	57	59	53	-6	-4	No
82	Residential (B)	66	55	56	51	-5	-4	No
83	Residential (B)	66	49	50	47	-3	-2	No
84	Residential (B)	66	52	53	49	-4	-3	No
85	Residential (B)	66	55	56	52	-4	-3	No
86	Residential (B)	66	52	54	49	-5	-3	No
87	Residential (B)	66	56	58	53	-5	-3	No
88	Residential (B)	66	55	57	52	-5	-3	No
89	Residential (B)	66	55	57	52	-5	-3	No
90	Residential (B)	66	60	61	56	-5	-4	No
91	Residential (B)	66	60	62	57	-5	-3	No
92	Residential (B)	66	60	62	57	-5	-3	No
93	Residential (B)	66	53	54	50	-4	-3	No
94	Residential (B)	66	53	54	50	-4	-3	No
95	Residential (B)	66	50	51	49	-2	-1	No
96	Residential (B)	66	50	52	49	-3	-1	No
97	Residential (B)	66	53	55	51	-4	-2	No
98	Commercial (E)	66	62	63	58	-5	-4	No
99	Residential (B)	66	51	53	49	-4	-2	No
100	Residential (B)	66	53	55	50	-5	-3	No
101	Residential (B)	66	53	54	50	-4	-3	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 Juneau Creek Noise Level (dBA)	Change Between 2043 No Build and 2034 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
102	Residential (B)	66	56	58	53	-5	-3	No
103	Residential (B)	66	59	61	56	-5	-3	No
104	Residential (B)	66	58	59	54	-5	-4	No
105	Residential (B)	66	64	**66**	61	-5	-3	No
106	Residential (B)	66	**69**	**70**	65	-5	-4	No
107	Commercial (E)	71	66	68	63	-5	-3	No
108	Residential	66	52	54	50	-4	-2	No
109	Commercial (E)	71	66	68	62	-6	-4	No
110	Commercial (E)	71	62	64	59	-5	-3	No
111	Commercial (E)	71	60	62	57	-5	-3	No
112	Residential (B)	66	58	60	55	-5	-3	No
113	Residential (B)	66	60	62	57	-5	-3	No
114	Residential (B)	66	59	60	56	-4	-3	No
115	Residential (B)	66	57	59	55	-4	-2	No
116	Residential (B)	66	59	60	55	-5	-4	No
117	Residential (B)	66	56	58	54	-4	-2	No
118	Residential (B)	66	57	59	56	-3	-1	No
119	Residential (B)	66	65	**66**	61	-5	-4	No
120	Residential (B)	66	58	59	55	-4	-3	No
121	Residential (B)	66	58	60	56	-4	-2	No
122	Residential (B)	66	59	61	57	-4	-2	No
123	Residential (B)	66	61	62	56	-6	-5	No
124	Residential (B)	66	59	60	60	0	1	No
125	Residential (B)	66	60	61	60	-1	0	No
126	Residential (B)	66	61	62	58	-4	-3	No
127	Residential (B)	66	58	59	56	-3	-2	No
128	Residential (B)	66	57	58	59	1	2	No
URR N	Campground (C)	66	44	46	45	-1	1	No
URR E	Campground (C)	66	40[a]	40[a]	42	2	2	No
URR S	Campground (C)	66	40[a]	40[a]	40	0	0	No
PK SE	Campground (C)	66	44	45	42	-3	-2	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 Juneau Creek Noise Level (dBA)	Change Between 2043 No Build and 2034 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
PK SW	Campground (C)	66	40[a]	40[a]	41	1	1	No
PK N	Campground (C)	66	40[a]	40[a]	42	2	2	No
CC N	Campground (C)	66	54	55	50	-5	-4	No
CC S	Campground (C)	66	47	48	43	-5	-4	No
RR	Campground (C)	66	52	53	53	0	1	No
KNWR 1	Recreation Area (C)	66	40[a]	40[a]	40	0	0	No
KNWR 2	Recreation Area (C)	66	48	50	58	8	10	No
KNWR 3	Recreation Area (C)	66	45	47	49	2	4	No
SP 1	Recreation Area (C)	66	59	60	56	-4	-3	No
SP 2	Recreation Area (C)	66	59	60	55	-5	-4	No
KRSMA 1	Recreation Area (C)	66	51	52	50	-2	-1	No
KRRA 2	Recreation Area (C)	66	**67**	**68**	63	-5	-4	No
KRRA 1	Recreation Area (C)	66	40[a]	40[a]	40	0	0	No
KRSMA 2	Recreation Area (C)	66	49	50	45	-5	-4	No
JCRA 1	Campground (C)	66	40[a]	40[a]	39	-1	-1	No
JCRA 2	Recreation Area (C)	66	40[a]	40[a]	43	3	3	No
JCRA 3	Trail (C)	66	40[a]	40[a]	52	12	12	No
BCT 1	Trail (C)	66	40[a]	40[a]	61	21	**21**	**Yes**
BCT 2	Trail (C)	66	40[a]	40[a]	43	3	3	No
ST 1	Trail (C)	66	40[a]	40[a]	37	-3	-3	No
ST 2	Trail (C)	66	40[a]	40[a]	36	-4	-4	No
CLBL	Recreation Area (C)	66	54	55	50	-5	-4	No

[a] Sites located in areas where traffic noise is not a significant contributor to existing ambient noise levels were characterized using measured ambient levels as described in Section 4.1.

5.4 Juneau Creek Variant Alternative

The Juneau Creek Variant Alternative is located in mostly undeveloped land. Figures 3 through 10 show the location of the alternative and modeled receptors. Table 11 lists the noise analysis results for the Juneau Creek Variant Alternative, which includes receptors along the existing alignment for comparison to the existing highway and No Build Alternative. Table 11 shows the computed noise levels in hourly Leq dBA for the existing highway (2012), No Build Alternative (2043) and the Juneau Creek Variant Alternative (2043). The existing highway and the 2043 No Build Alternative results are compared to the 2043 Build Alternative results and the differences are shown. The computed noise levels are compared to the NAC. Bold font identifies levels that approach, meet, or exceed the NAC.

Under the Juneau Creek Variant Alternative, noise levels at modeled receptors are predicted to be between 35 and 63 dBA. In cases where predicted future Build Alternative noise levels are estimated to be below 40 dBA for receptors (ST1 and ST2) that have existing and No Build noise levels assumed to be at 40 dBA from ambient measurement data (see Section 4.1), actual future levels may not be as low as predicted. The low modeled results for these locations indicates that the highway would likely have little or no effect on ambient noise levels due to the distance between the proposed highway alignment and the receptors. If existing ambient levels are around 40 dBA, as assumed, then those levels would likely prevail at these locations.

Changes in noise levels between the existing condition and the Juneau Creek Variant Alternative at specific receptors range from a decrease of 6 dBA to an increase of 21 dBA. Changes in noise levels between the No Build Alternative and the Juneau Creek Variant Alternative at specific receptors range from a decrease of 7 dBA to an increase of 21 dBA. Changes in noise levels between the No Build and the Juneau Creek Variant Alternative is due to changes in traffic volumes, changes in roadway alignments, and changes in shielding. No receptors are predicted to have 2043 noise levels approaching the NAC under the Juneau Creek Variant Alternative. One trail site (BCT 1) is predicted to have a substantial increase impact in 2043 under the Juneau Creek Variant Alternative.

Table 11: Noise Analysis Results –Juneau Creek Variant Alternative

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 Juneau Creek Variant Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
1	Residential (B)	66	63	65	58	-7	-5	No
2	Residential (B)	66	59	60	53	-7	-6	No
3	Residential (B)	66	51	53	47	-6	-4	No
4	Residential (B)	66	54	55	49	-6	-5	No
5	Residential (B)	66	53	54	47	-7	-6	No
6	Residential (B)	66	57	59	52	-7	-5	No
7	Residential (B)	66	52	53	47	-6	-5	No
8	Residential (B)	66	49	51	44	-7	-5	No
9	Residential (B)	66	54	56	49	-7	-5	No
10	Residential (B)	66	56	58	51	-7	-5	No
11	Residential (B)	66	54	56	49	-7	-5	No
12	Residential (B)	66	51	52	46	-6	-5	No
13	Residential (B)	66	51	52	46	-6	-5	No
14	Residential (B)	66	62	64	57	-7	-5	No
15	Residential (B)	66	50	52	45	-7	-5	No
16	Residential (B)	66	61	63	56	-7	-5	No
17	Residential (B)	66	63	64	57	-7	-6	No
18	Residential (B)	66	56	58	51	-7	-5	No
19	Residential (B)	66	50	52	45	-7	-5	No
20	Residential (B)	66	51	53	46	-7	-5	No
21	Residential (B)	66	65	**66**	59	-7	-6	No
22	Residential (B)	66	51	53	46	-7	-5	No
23	Residential (B)	66	55	56	49	-7	-6	No
24	Residential (B)	66	55	56	50	-6	-5	No
25	Residential (B)	66	55	56	50	-6	-5	No
26	Residential (B)	66	54	55	49	-6	-5	No
27	Residential (B)	66	60	61	54	-7	-6	No
28	Residential (B)	66	54	55	49	-6	-5	No
29	Residential (B)	66	52	54	47	-7	-5	No
30	Residential (B)	66	51	53	46	-7	-5	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 Juneau Creek Variant Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
31	Residential (B)	66	51	52	46	-6	-5	No
32	Residential (B)	66	50	51	46	-5	-4	No
34	Residential (B)	66	50	52	46	-6	-4	No
35	Residential (B)	66	60	61	54	-7	-6	No
36	Residential (B)	66	58	59	52	-7	-6	No
37	Residential (B)	66	54	55	49	-6	-5	No
40	Residential (B)	66	59	60	53	-7	-6	No
41	Residential (B)	66	60	61	54	-7	-6	No
42	Residential (B)	66	49	52	45	-7	-4	No
44	Residential (B)	66	55	56	48	-7	-4	No
45	Residential (B)	66	52	53	47	-6	-5	No
46	Residential (B)	66	53	55	47	-6	-5	No
47	Residential (B)	66	60	61	47	-6	-5	No
48	Residential (B)	66	55	57	47	-6	-5	No
49	Residential (B)	66	63	64	49	-7	-6	No
50	Residential (B)	66	57	59	47	-6	-5	No
51	Residential (B)	66	53	55	48	-7	-5	No
52	Residential (B)	66	50	51	54	-7	-6	No
53	Residential (B)	66	55	56	50	-7	-5	No
54	Residential (B)	66	52	53	57	-7	-6	No
55	Residential (B)	66	53	55	52	-7	-5	No
56	Residential (B)	66	60	61	48	-7	-5	No
57	Residential (B)	66	55	57	46	-5	-4	No
62	Residential (B)	66	53	54	48	-6	-5	No
63	Residential (B)	66	53	55	48	-7	-5	No
64	Residential (B)	66	60	61	54	-7	-6	No
65	Residential (B)	66	62	63	56	-7	-6	No
66	Residential (B)	66	61	63	56	-7	-5	No
67	Residential (B)	66	61	63	56	-7	-5	No
68	Residential (B)	66	52	54	48	-6	-4	No
69	Residential (B)	66	53	54	48	-6	-5	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 Juneau Creek Variant Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
70	Residential (B)	66	52	53	47	-6	-5	No
71	Residential (B)	66	50	52	46	-6	-4	No
72	Residential (B)	66	53	54	48	-6	-5	No
73	Residential (B)	66	53	55	48	-7	-5	No
74	Residential (B)	66	59	60	54	-6	-5	No
75	Residential (B)	66	56	57	51	-6	-5	No
76	Residential (B)	66	59	61	54	-7	-5	No
77	Residential (B)	66	56	57	51	-6	-5	No
78	Residential (B)	66	61	62	55	-7	-6	No
80	Residential (B)	66	54	55	49	-6	-5	No
81	Residential (B)	66	57	59	52	-7	-5	No
82	Residential (B)	66	55	56	49	-7	-6	No
83	Residential (B)	66	49	50	46	-4	-3	No
84	Residential (B)	66	52	53	48	-5	-4	No
85	Residential (B)	66	55	56	50	-6	-5	No
86	Residential (B)	66	52	54	48	-6	-4	No
87	Residential (B)	66	56	58	52	-6	-4	No
88	Residential (B)	66	55	57	51	-6	-4	No
89	Residential (B)	66	55	57	51	-6	-4	No
90	Residential (B)	66	60	61	55	-6	-5	No
91	Residential (B)	66	60	62	55	-7	-5	No
92	Residential (B)	66	60	62	55	-7	-5	No
93	Residential (B)	66	53	54	49	-5	-4	No
94	Residential (B)	66	53	54	49	-5	-4	No
95	Residential (B)	66	50	51	48	-3	-2	No
96	Residential (B)	66	50	52	48	-4	-2	No
97	Residential (B)	66	53	55	50	-5	-3	No
98	Commercial (E)	71	62	63	57	-6	-5	No
99	Residential (B)	66	51	53	49	-4	-2	No
100	Residential (B)	66	53	55	50	-5	-3	No
101	Residential (B)	66	53	54	50	-4	-3	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 Juneau Creek Variant Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
102	Residential (B)	66	56	58	52	-6	-4	No
103	Residential (B)	66	59	61	54	-7	-5	No
104	Residential (B)	66	58	59	53	-6	-5	No
105	Residential (B)	66	64	**66**	59	-7	-5	No
106	Residential (B)	66	**69**	**70**	63	-7	-6	No
107	Commercial (E)	71	66	68	61	-7	-5	No
108	Residential (B)	66	52	54	50	-4	-2	No
109	Commercial (E)	71	66	68	61	-7	-5	No
110	Commercial (E)	71	62	64	57	-7	-5	No
111	Commercial (E)	71	60	62	55	-7	-5	No
112	Residential (B)	66	58	60	55	-5	-3	No
113	Residential (B)	66	60	62	56	-6	-4	No
114	Residential (B)	66	59	60	55	-5	-4	No
115	Residential (B)	66	57	59	54	-5	-3	No
116	Residential (B)	66	59	60	54	-6	-5	No
117	Residential (B)	66	56	58	54	-4	-2	No
118	Residential (B)	66	57	59	55	-4	-2	No
119	Residential (B)	66	65	**66**	60	-6	-5	No
120	Residential (B)	66	58	59	55	-4	-3	No
121	Residential (B)	66	58	60	55	-5	-3	No
122	Residential (B)	66	59	61	56	-5	-3	No
123	Residential (B)	66	61	62	55	-7	-6	No
124	Residential (B)	66	59	60	60	0	1	No
125	Residential (B)	66	60	61	60	-1	0	No
126	Residential (B)	66	61	62	57	-5	-4	No
127	Residential (B)	66	58	59	55	-4	-3	No
128	Residential (B)	66	57	58	59	1	2	No
URR N	Campground (C)	66	44	46	47	1	3	No
URR E	Campground (C)	66	40[a]	40[a]	43	3	3	No
URR S	Campground (C)	66	40[a]	40[a]	41	1	1	No
PK SE	Campground (C)	66	44	45	41	-4	-3	No

Receptor ID	Residential, Commercial, Campground	Noise Abatement Criteria (dBA)	2012 Existing Noise Level (dBA)	2043 No Build Noise Level (dBA)	2043 Juneau Creek Variant Noise Level (dBA)	Change Between 2043 No Build and 2043 Build	Change Between 2012 Existing and 2043 Build	Predicted Build Impact? (Yes/No)
PK SW	Campground (C)	66	40[a]	40[a]	41	1	1	No
PK N	Campground (C)	66	40[a]	40[a]	42	2	2	No
CC N	Campground (C)	66	54	55	49	-6	-5	No
CC S	Campground (C)	66	47	48	42	-6	-5	No
RR	Campground (C)	66	52	53	56	3	4	No
KNWR 1	Recreation Area (C)	66	40[a]	40[a]	40	0	0	No
KNWR 2	Recreation Area (C)	66	48	50	50	0	2	No
KNWR 3	Recreation Area (C)	66	45	47	50	3	5	No
SP 1	Recreation Area (C)	66	59	60	59	-1	0	No
SP 2	Recreation Area (C)	66	59	60	58	-2	-1	No
KRSMA 1	Recreation Area (C)	66	51	52	52	0	1	No
KRRA 2	Recreation Area (C)	66	**67**	**68**	61	-7	-6	No
KRRA 1	Recreation Area (C)	66	40[a]	40[a]	40	0	0	No
KRSMA 2	Recreation Area (C)	66	49	50	44	-6	-5	No
JCRA 1	Campground (C)	66	40[a]	40[a]	40	0	0	No
JCRA 2	Recreation Area (C)	66	40[a]	40[a]	42	2	2	No
JCRA 3	Trail (C)	66	40[a]	40[a]	51	11	11	No
BCT 1	Trail (C)	66	40[a]	40[a]	61	21	**21**	**Yes**
BCT 2	Trail (C)	66	40[a]	40[a]	43	3	3	No
ST 1	Trail (C)	66	40[a]	40[a]	37	-3	-3	No
ST 2	Trail (C)	66	40[a]	40[a]	35	-5	-5	No
CLBL	Recreation Area (C)	66	54	55	49	-6	-5	No

[a] Sites located in areas where traffic noise is not a significant contributor to existing ambient noise levels were characterized using measured ambient levels as described in Section 5.1.

5.5 Rumble Strip Noise

As part of the highway construction under the project Build Alternatives, the DOT&PF anticipates installing rumble strips in compliance with their highway safety policies. DOT&PF's policy is to install shoulder rumble strips on primary high speed highways (which are those with posted speeds equal to or greater than 50 mph, and which have shoulders that are six foot or greater in width), and centerline rumble strips in corridors with high recorded incidences of head-on crashes.

The demonstrated purpose of rumble strips is to prevent 1/5 to 1/3 of run-off-road crashes and head-on crashes on main roads. According to the Strategic Highway Safety Plan (SHSP), approximately 40 lives are lost statewide per year due to single-vehicle run-off-road (SVROR) crashes. Another 15 lives are lost annually due to head-on collisions.

The new highway alignments included in the Sterling Highway project would qualify for shoulder rumble strips, but not centerline rumble strips unless a problem were to develop in the future. The existing alignment would be eligible for centerline rumble strip consideration.

A noise study conducted by the Texas Transportation Institute (Texas Transportation Institute, 2006) concluded the overall exterior noise was increased by road vehicles driving over rumble strips, but that the increase in noise was not significant. The noise of a road vehicle traveling at 55 miles per hour while driving over rumble strips was measured to be less than the noise of a commercial vehicle (such as a large truck) traveling on the same road without driving over the rumble strips. Additional highway noise from drivers hitting rumble strips is intermittent and random, rather than sustained.

It is not anticipated that periodic rumble strip noise will cause substantial changes in the predicted noise levels presented above.

6.0 Traffic Noise Impacts

Table 12 summarizes the receptors by impact type and alternative.

Table 12: Summary of Predicted Noise Impacts

NAC Class	Receptor Types		2012 Existing	2043 No Build	2043 Cooper Creek	2043 G South	2043 Juneau Creek	2043 Juneau Creek Variant
B	Residential	Meets or Exceeds NAC	1	4	4	0	0	0
		Substantial Increase	-	0	0	0	0	0
C	Campsite, Recreational areas, trails	Meets or Exceeds NAC	1	1	1	1	0	0
		Substantial Increase	-	0	1	1	1	1
E	Commercial	Meets or Exceeds NAC	0	0	1	0	0	0
		Substantial Increase	-	0	0	0	0	0
Total Number of Properties Impacted			**2**	**5**	**7**	**2**	**1**	**1**

7.0 Noise Abatement Measures

Noise abatement measures are considered in areas where predicted traffic noise levels approach or exceed the noise abatement criteria, or when the predicted traffic noise levels substantially exceed the existing noise levels. Abatement measures are considered for these receptors consistent with the DOT&PF guidelines.

Where traffic noise impacts are identified, noise abatement is considered and evaluated for acoustic feasibility and reasonableness. DOT&PF policy is that abatement for Activity Category A, B, C, D or E needs to be feasible and reasonable on their own merits. Land uses not sensitive to highway traffic noise, and undeveloped lands will not be provided noise abatement.

Acoustic feasibility criteria deal primarily with physics and engineering considerations (i.e., can a substantial noise reduction be achieved given the conditions of a specific location; is the ability to achieve noise reduction limited by factors such as topography, access requirements for driveways or ramps, the presence of cross streets, or other noise sources in the area).

Reasonableness is a more subjective criterion than feasibility. It implies that common sense and good judgment were applied in arriving at a decision. Reasonableness is based on a number of factors, not just one criterion. FHWA noise regulations define three mandatory reasonableness factors that must be evaluated for a noise abatement measure to be considered reasonable. They are:

- Viewpoints of the property owners and residents of the benefitted receptors
    - Views of the property owners and residents that benefit from noise abatement measures. To determine the desires of benefited households and property owners, DOT&PF will contact all benefited households and property owners to determine

the level of interest for a noise abatement measure. At least 60 percent of households and property owners surveyed must want the noise abatement measure.

- Cost Effectiveness
  - The DOT&PF policy states that the noise abatement measure cost is no more than $32,000 per benefited receptor, based upon the design engineer's estimate. A benefited receptor is defined as the recipient of an abatement measure that receives a noise reduction at or above the minimum threshold of 5 dBA.
- Noise Reduction Design Goal
  - The DOT&PF noise reduction design goal is a minimum of 7 dBA. 50 percent or more of the benefitted receptors in the first row of structures must achieve this design goal for the noise abatement to be considered reasonable.

The DOT&PF considers these three mandatory reasonableness factors to determine reasonableness. The following reasonableness factors are also used to evaluate mitigation on state-funded projects:

- Development vs. Highway Timing
  - At least 50 percent of impacted receptors in the development (subdivision, apartment complex, etc.) were built before initial construction of the highway. The date of development is an important part of the determination of reasonableness. More consideration is given to developments that were built before the highway was built.
- Development Existence
  - At least 50 percent of impacted receptors in the development have existed for at least 10 years. More consideration is given to residents who have experienced traffic noise impacts for long periods of time.
- Absolute Predicted Build Noise Level
  - The predicted future Build noise levels are at least 66 dBA. More consideration should be given to areas with higher absolute traffic noise levels.
- Relative Predicted Build Noise Level
  - The predicted future Build noise levels are at least 10 dBA greater than the existing noise levels. More consideration is given to areas with larger increases over existing noise levels.
- Build vs. No Build Noise Levels
  - The future Build noise levels are at least 5 dBA greater than the future No Build noise levels. More consideration is given to areas where larger changes in traffic noise levels are expected to occur if the project is constructed than if it is not.

No single DOT&PF reasonableness factor is used to determine that a noise abatement measure is unreasonable.

It should be noted that noise barriers could have their own negative impacts. Barriers may interfere with the passage of air, interrupt scenic views, create objectionable shadows, contribute to increased road icing, decrease wildlife mobility, and reduce or eliminate visibility of a

business from the roadway. Barriers could also create snow removal problems, cause maintenance access problems, make it difficult to maintain landscaping, create drainage problems, and provide pockets for trash and garbage to accumulate. Depending on location, noise barriers could also compromise traffic safety by reducing stopping or merging sight distance, or by reducing errant vehicle recovery room.

Noise abatement, in the form of noise barriers, was considered for all receptors predicted to be impacted under the project Build alternatives.

7.1 Discussion of Noise Barriers

7.1.1 *Existing and No Build Conditions*

While noise impacts were identified at receptors 106 and KRRA 2 under the existing condition; and at receptors 21, 105, 106, 119, and KRRA2 under the 2043 No Build Alternative, no noise abatement is proposed. The DOT&PF does not have a retrofit noise barrier (Type II) program.

7.1.2 *Cooper Creek Alternative*

Impacted receptors identified under the Cooper Creek Alternative include receptors 87, 105, 106, 107, 119, KRRA 2, and ST 1. Noise mitigation was considered but not evaluated in detail for the following reasons:

- Receptor 87 is assumed to be acquired under the Cooper Creek Alternative, given its location relative to the alignment footprint. Mitigation is not recommended for this receptor.
- Receptor 105 is located on a residential parcel (the same parcel occupied by Receptor 106) but represents a non-residential structure. Receptor 105 is a garage and therefore is not considered to be a land use sensitive to highway noise according to the DOT&PF Noise Policy. Mitigation is not recommended for this receptor.
- Receptors 106 and 119 are residences with direct driveway access onto the Sterling Highway. Noise walls for single, isolated residences are not typically able to meet cost-effectiveness (reasonableness) criteria because of the length of wall needed to meet the DOT&PF noise reduction goal. In addition, the ability of noise walls to achieve acceptable noise reduction is greatly reduced by the need for gaps in noise walls for driveway access. Consequently, noise barriers were determined not to be feasible and are not recommended for these receptors.
- Receptor 107 is a commercial property; DOT&PF does not provide mitigation for commercial properties or undeveloped lands. Mitigation is not recommended for this receptor.
- KRRA 2 is a representative location in the Kenai River Recreation Area and used to evaluate noise levels at locations near to the highway in this section of the recreation area. It does not represent a specific, discrete use area (such as a campground, picnic site, etc.). Noise abatement cannot typically be provided for large recreational areas in a cost-effective manner and therefore mitigation is not recommended for this receptor.

- ST 1 is a representative location on the Stetson Trail and used to evaluate noise levels at locations near to the highway in this section of the project area. It does not represent a specific, discrete use area (such as a campground, picnic site, etc.). Noise abatement cannot typically be provided for large recreational areas in a cost-effective manner and therefore mitigation is not recommended for this receptor.

7.1.3 *G South Alternative*

Noise impacts were predicted at receptors KRRA 2 and BCT 2 under the G South Alternative. Noise abatement was considered at these receptors. In some cases, noise mitigation was considered but not evaluated in detail for the following reasons:

- KRRA 2 is a representative location in the Kenai River Recreation Area and used to evaluate noise levels at locations near to the highway in this section of the recreation area. It does not represent a specific, discrete use area (such as a campground, picnic site, etc.). Noise abatement cannot typically be provided for large recreational areas in a cost-effective manner and therefore mitigation is not recommended for this receptor.
- BCT 2 is a representative location on the Bean Creek Trail and used to evaluate noise levels at locations near to the highway in this section of the project area. It does not represent a specific, discrete use area (such as a campground, picnic site, etc.). Noise abatement cannot typically be provided for large recreational areas in a cost-effective manner and therefore mitigation is not recommended for this receptor.

7.1.4 *Juneau Creek Alternative*

Noise impacts were predicted at receptor BCT 1 under the Juneau Creek Alternative. Noise mitigation was considered but not evaluated in detail for the following reasons:

- BCT 1 is a representative location on the Bean Creek Trail and used to evaluate noise levels at locations near to the highway in this section of the project area. It does not represent a specific, discrete use area (such as a campground, picnic site, etc.). Noise abatement cannot typically be provided for large recreational areas in a cost-effective manner and therefore mitigation is not recommended for this receptor.

7.1.5 *Juneau Creek Variant Alternative*

Noise impacts were predicted at receptor BCT 1 under the Juneau Creek Variant Alternative. Noise mitigation was considered but not evaluated in detail for the following reasons:

- BCT 1 is a representative location on the Bean Creek Trail and used to evaluate noise levels at locations near to the highway in this section of the project area. It does not represent a specific, discrete use area (such as a campground, picnic site, etc.). Noise abatement cannot typically be provided for large recreational areas in a cost-effective manner and therefore mitigation is not recommended for this receptor.

8.0 Construction Noise

It is difficult to reliably predict levels of construction noise at a particular receptor or group of receptors. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. Daily construction normally occurs during daylight hours when occasional loud noises are more tolerable. No one receptor is expected to be exposed to construction noise of long duration; therefore, extended disruption of normal activities is not anticipated. However, provisions will be included in the plans and specifications requiring the contractor to make every reasonable effort to minimize construction noise through abatement measures such as compliance with the local noise code and maintenance of muffler systems.

9.0 Conclusion

Using the 2011 DOT&PF *Noise Policy*, this highway traffic noise analysis of the Sterling Highway MP 45 to 60 Project identified one existing noise impact to a residential receptor and one existing noise impact to a recreational receptor; and predicted four residential impacts and one recreational area impact under the 2043 No Build Alternative. Evaluation of the four Build alternatives yielded a total of four residential impacts, one commercial impact, and two recreational site impacts under the Cooper Creek Alternative; two recreational site impacts under the G South Alternative; one recreational site impacts under the Juneau Creek Alternative; and one recreational site impacts under the Juneau Creek Variant Alternative.

Noise abatement options for the impacted receptors were considered, but abatement measures were not recommended. This recommendation is based upon preliminary design information and existing policies. Recommendations will be re-evaluated during the design phase of the project to determine whether they remain valid.

10.0 References

Alaska DOT&PF. 2011. *Noise Policy.* April 2011.

Federal Highway Administration. 23 C.F.R. § 772. Procedures for Abatement of Highway Traffic Noise and Construction Noise.

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Texas Transportation Institute. 2006. *Exterior Noise Created by Vehicles Traveling Over Rumble Strips.* Texas Transportation Institute, Nov 9, 2006 by M. Finley, P.E. and J. Miles, E.I.T. (presented at the Transportation Research Board annual meeting in 2007).

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FIGURES

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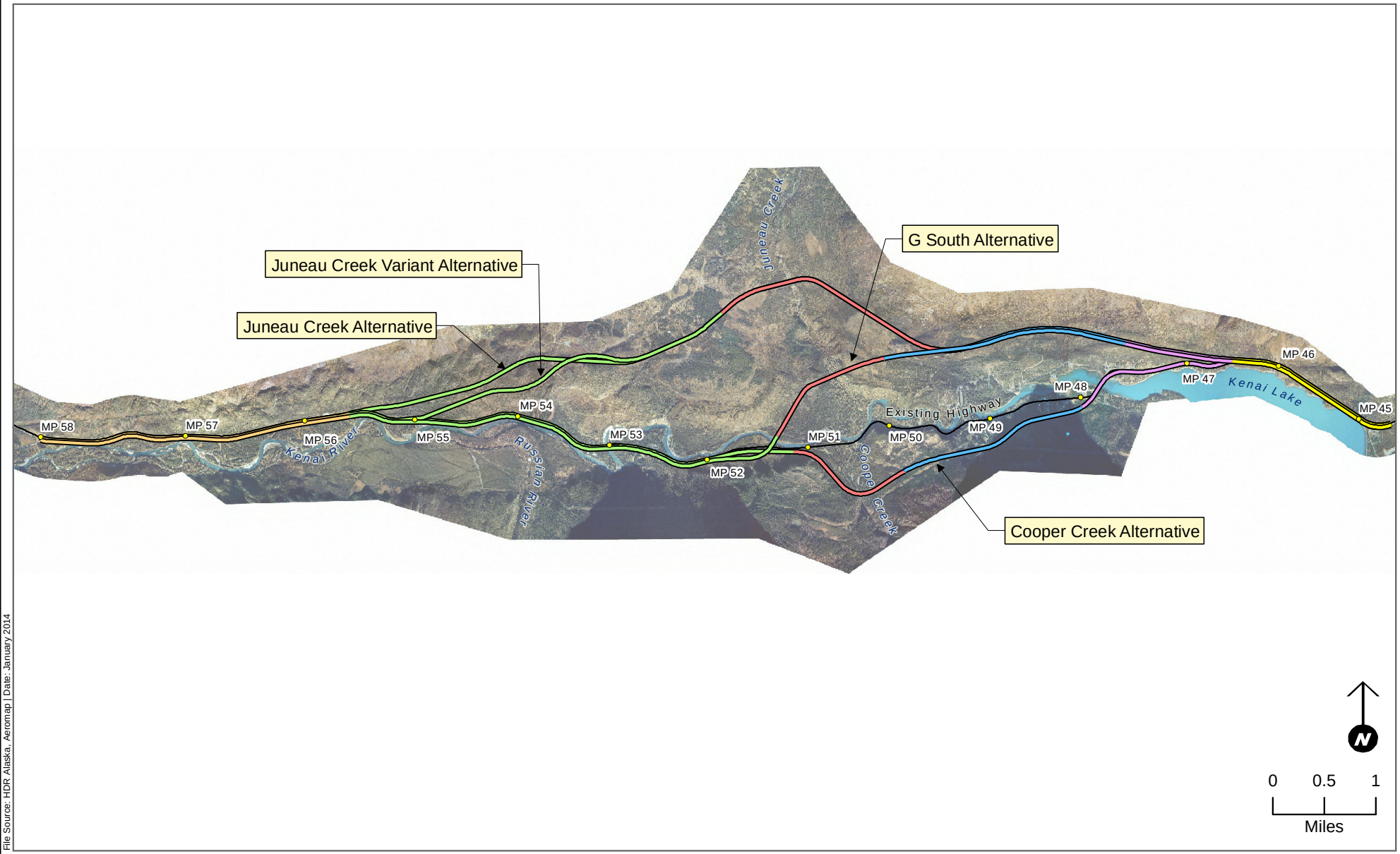
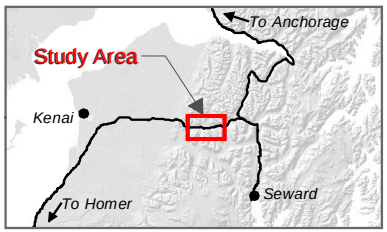


File Source: HDR Alaska, Aeromap | Date: January 2014

STERLING
HIGHWAY MILE POST 45 TO 60
ALASKA



Legend

Traffic Analysis Segments

- 1
- 2
- 3
- 4
- 5
- 6
- Existing Sterling Highway

Traffic Analysis Segments

Figure 1

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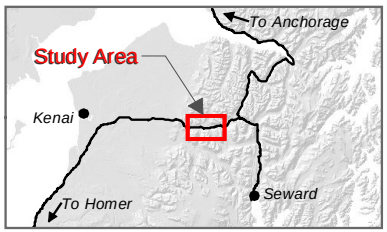
STERLING
HIGHWAY MILE POST 45 TO 60
ALASKA



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- Monitoring Locations
- Existing Sterling Highway

Project Alternatives

- Cooper Creek
- G South
- Juneau Creek
- Juneau Creek Variant

Noise Monitoring Locations

Figure 2

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STERLING
HIGHWAY MILE POST 45 TO 60
ALASKA

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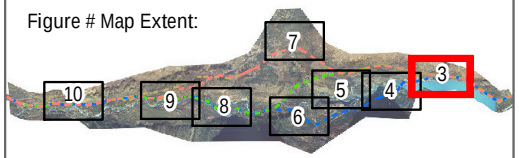

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Project Alternatives

- Cooper Creek
- G South
- Juneau Creek
- Juneau Creek Variant

- Noise Sensitive Receptor
- Existing Highway
- Parcel Boundary

Noise Sensitive Receptors

Figure 3

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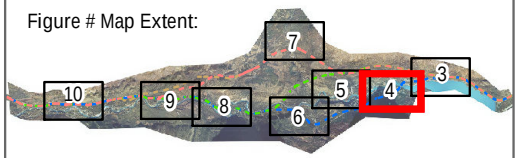
STERLING
HIGHWAY MILE POST 45 TO 60
ALASKA

Figure # Map Extent:



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Project Alternatives

- Cooper Creek
- G South
- Juneau Creek
- Juneau Creek Variant

- Noise Sensitive Receptor
- Existing Highway
- Parcel Boundary

Noise Sensitive Receptors

Figure 4

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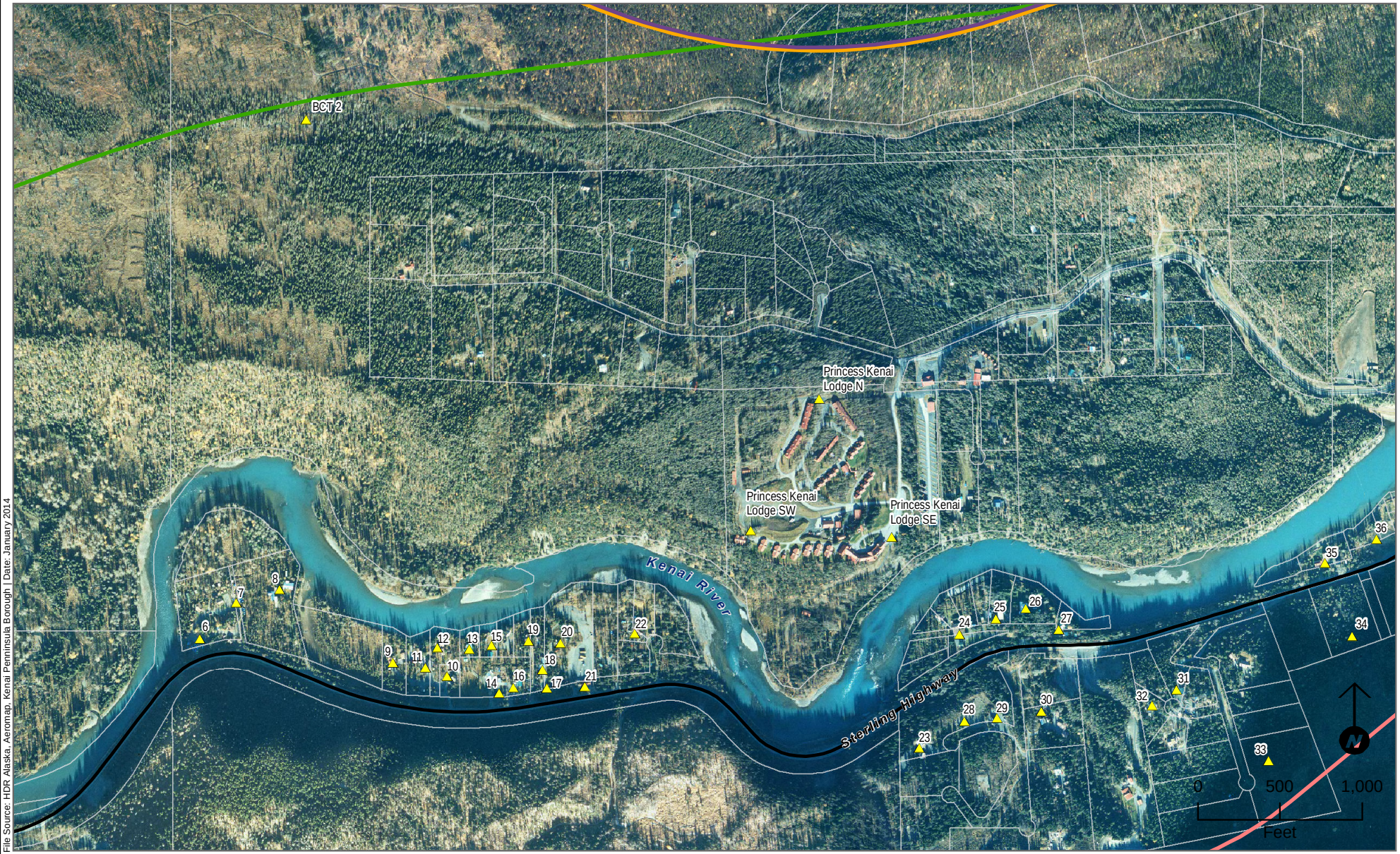

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STERLING
HIGHWAY MILE POST 45 TO 60
ALASKA

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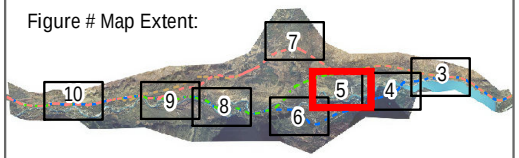

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Project Alternatives

- Cooper Creek
- G South
- Juneau Creek
- Juneau Creek Variant

- Noise Sensitive Receptor
- Existing Highway
- Parcel Boundary

Noise Sensitive Receptors

Figure 5

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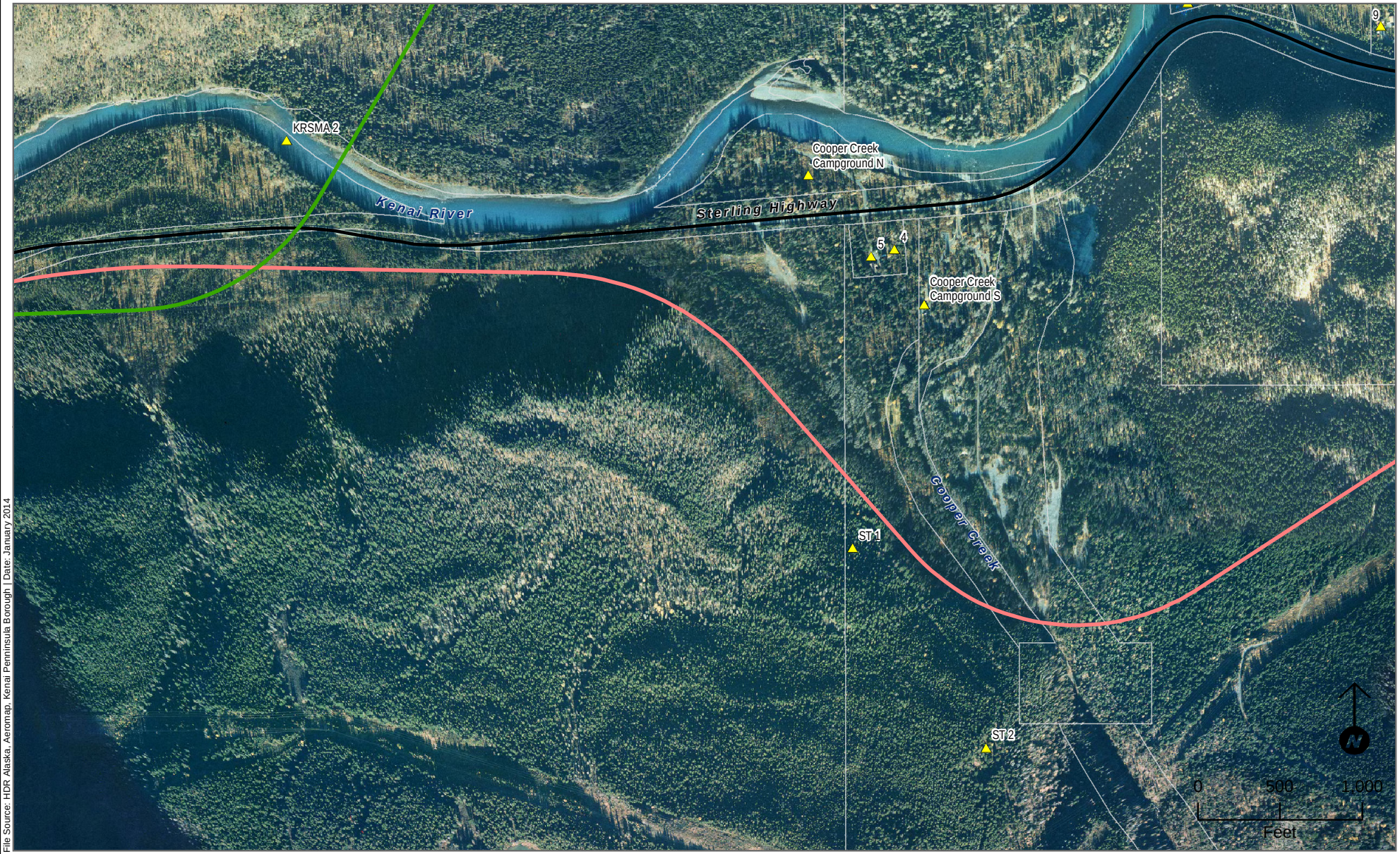

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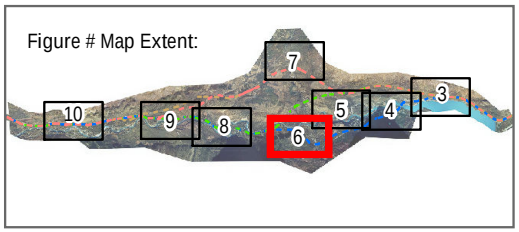
HIGHWAY MILE POST 45 TO 60
ALASKA



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Project Alternatives

- Cooper Creek
- G South
- Juneau Creek
- Juneau Creek Variant

- Noise Sensitive Receptors
- Existing Highway
- Parcel Boundary

Noise Sensitive Receptors

Figure 6

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STERLING
HIGHWAY MILE POST 45 TO 60
ALASKA

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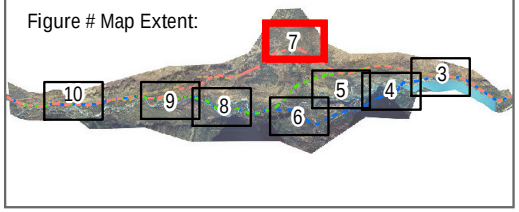

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Project Alternatives

- Cooper Creek
- G South
- Juneau Creek
- Juneau Creek Variant

- Noise Sensitive Receptor
- Existing Highway
- Parcel Boundary

Noise Sensitive Receptors

Figure 7

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STERLING
HIGHWAY MILE POST 45 TO 60
ALASKA

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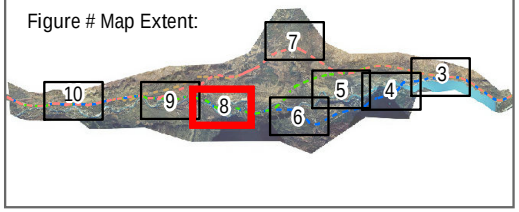

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Project Alternatives

- Cooper Creek
- G South
- Juneau Creek
- Juneau Creek Variant

- Noise Sensitive Receptor
- Existing Highway
- Parcel Boundary

Noise Sensitive Receptors

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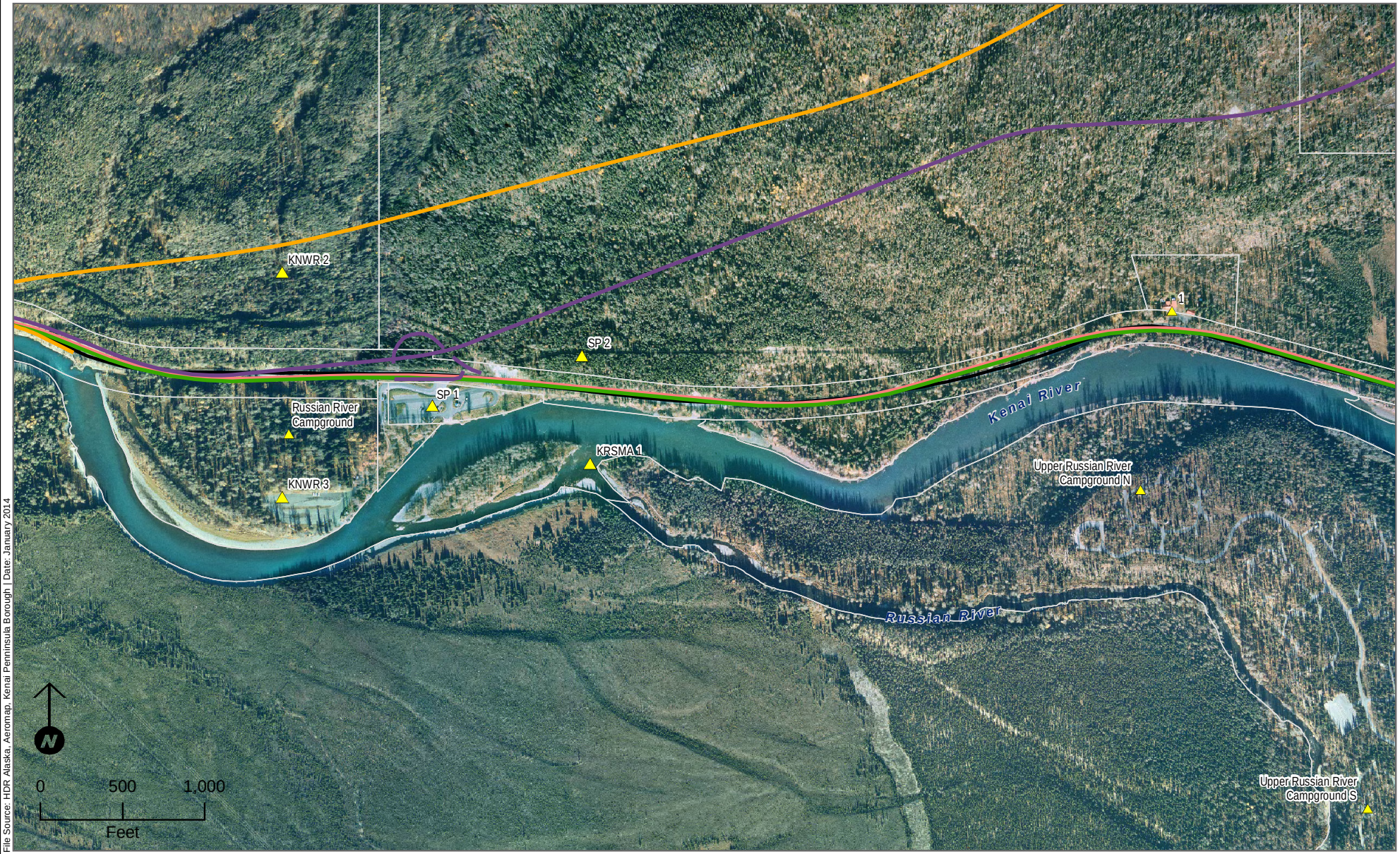

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STERLING
HIGHWAY MILE POST 45 TO 60
ALASKA

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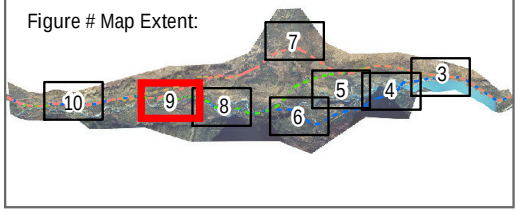

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Project Alternatives

- Cooper Creek
- G South
- Juneau Creek
- Juneau Creek Variant

- Noise Sensitive Receptor
- Existing Highway
- Parcel Boundary

Noise Sensitive Receptors

Figure 9

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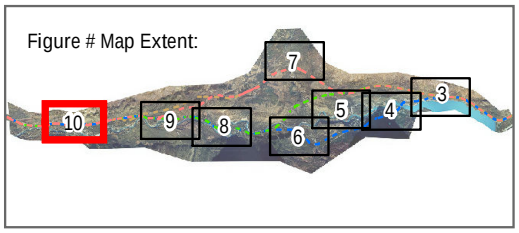
STERLING
HIGHWAY MILE POST 45 TO 60
ALASKA

Figure # Map Extent:



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Project Alternatives

- Cooper Creek
- G South
- Juneau Creek
- Juneau Creek Variant

- Noise Sensitive Receptor
- Existing Highway
- Parcel Boundary

Noise Sensitive Receptors

Figure 10

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Appendix E
Preliminary Location Hydraulic Study

Prepared for:

State of Alaska
Department of Transportation and
Public Facilities

Prepared by:
HDR Alaska, Inc.
2525 C Street, Suite 305
Anchorage, Alaska 99503

February 2014

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Acronyms and Abbreviations

FEMA	Federal Emergency Management Administration
NFIP	National Flood Insurance Program
LHS	*Location Hydraulic Study*
DOT&PF	Alaska Department of Transportation and Public Facilities
FHWA	Federal Highway Administration
EIS	Environmental Impact Statement
FIRMS	Flood Insurance Rate Maps
USACE	U.S. Army Corps of Engineers
MP	Milepost

1 Introduction

This preliminary *Location Hydraulic Study* (LHS) was prepared to determine whether and where the reasonable alternatives (the four build alternatives) for the proposed Sterling Highway Milepost (MP) 45 to 60 Project encroach onto the mapped 100-year or base floodplain and associated floodways. The study also compares the encroachments of the four build alternatives with those of the existing roadway (the No Build Alternative).

2 Project Description

The Sterling Highway is the only road connection to the western and southern portions of Alaska's Kenai Peninsula. Because of growing populations in Kenai Peninsula communities and greater recreational pressure in the area, residential, commercial, and tourist vehicle traffic on the Sterling Highway is increasing. In response to these changes, much of the Sterling Highway has been upgraded to current design standards. The portion of the highway between MP 45 and 60 has not seen any substantial upgrade since it was first constructed in the 1950s.

From MP 45 to 60, the Sterling Highway is located in the Kenai Peninsula Borough (Borough) about 100 highway miles south of Anchorage, Alaska. Constrained by rugged mountain topography, this segment of the Sterling Highway is situated in the Kenai River Valley and in many places is immediately adjacent to the Kenai River. Cooper Landing, an unincorporated community of about 300 people, is located along the highway at approximately MP 48.

In order to meet current design standards and reduce traffic congestion along this corridor, the Alaska Department of Transportation and Public Facilities (DOT&PF), in conjunction with the Federal Highway Administration (FHWA), is preparing a supplemental draft environmental impact statement (EIS) for the Sterling Highway MP 45 to 60 Project. The primary goal of this project is to improve the Sterling Highway in the Cooper Landing and Kenai River area so that it meets current "rural principal arterial" standards and thereby reduces congestion and improves safety.

3 Definitions

***Base Flood**:* The base flood is defined as the 1-percent annual chance flood, also known as the "100-year flood." An event of the magnitude of the base flood or greater has a 1 percent chance of occurring any year.

***Flood Hazard Area**:* Same as "Mapped Floodplain." The area inundated by the base flood that has been identified by the Federal Emergency Management Administration (FEMA) and is managed as part of the National Flood Insurance Program (NFIP).

***Floodplain**:* A floodplain is the area adjacent to a river channel that is inundated with water during floods. Floodplains store, convey, and slow floodwaters. When floodplains are constricted by structures or fill, their capacity to temper floods is reduced, and flood elevations may rise. All rivers have floodplains, but not all floodplains are legally defined by mapping.

***Mapped Floodplain**:* A regulatory or managed floodplain is called a Mapped Floodplain in this document. FEMA has adopted the 1-percent annual chance flood as the base flood for flood insurance and management purposes. Therefore, the FEMA mapped floodplain corresponds to the area that would be inundated by the base flood. FEMA has mapped floodplains on a portion of the Kenai River. Floodplains are mapped using approximate or detailed methods.

Approximate studies yield floodplains that have no water surface elevations associated with them. Detailed studies provide water surface elevations at intervals along the floodplain. Development on a mapped floodplain is subject to Borough Floodplain Ordinances and Federal regulatory requirements. Development on a floodplain that has not been mapped is not subject to these ordinances and requirements. Mapped floodplains are also called "Flood Hazard Areas." Mapped floodplains can be found on Flood Insurance Rate Maps (FIRMS). At this time, the FEMA 1981 mapped floodplain is the effective regulatory floodplain. The U.S. Army Corps of Engineers (USACE) has conducted studies updating the mapped floodplain in a portion of this area, but until FEMA and the Borough adopt the map, it is considered preliminary. For this document, both the "effective" mapped floodplains and "preliminary" mapped floodplains are considered; see Section 4.3.

***Regulatory Floodway**:* A regulatory floodway may be established as a portion of the mapped floodplain. A floodway is the river channel and portion of the floodplain that conveys the majority of floodwaters when the floodplain is unencroached. If the floodplain were completely blocked off up to the floodway margins, the base flood elevation would be increased by no more than 1 foot (some communities allow less of an increase). The floodway is a regulatory tool that helps the community to determine whether a proposed development will increase flood hazards. Typically, encroachments on floodplains are allowed only if the developer can show that it will not cause more than a 1-foot increase in base flood elevations (see Figure 1). Encroachments on floodways are typically not allowed unless the developer can show that they will cause no increase in base flood elevations. An encroachment on a floodplain outside of a floodway by definition can cause less than a 1-foot rise in base flood elevations, as long as the floodway is left clear.

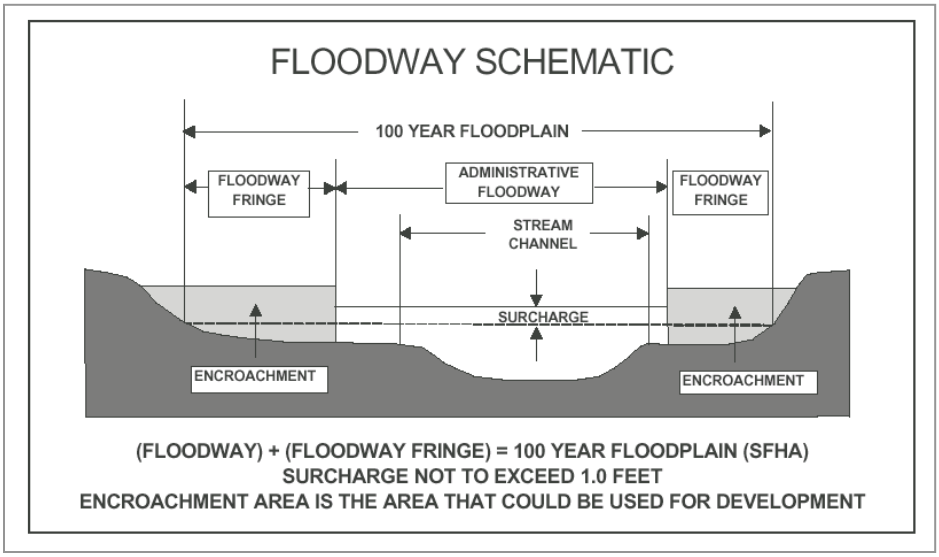

Figure 1. Illustration of a floodplain with a floodway

The FEMA 1981 mapping does not identify a regulatory floodway within the study area. The USACE preliminary mapping does identify a floodway in the area they studied in the upper Kenai River. See Figure 2.

4 Regulatory Setting

4.1 Federal Regulations

The FHWA requires an LHS during the planning of highway improvements where construction may encroach on mapped floodplains or regulatory floodways (Title 23, Code of Federal Regulations, Part 650, Subpart A). The purpose of the LHS is to determine whether a highway location alternative encroaches on a regulatory floodplain/floodway, whether there are practicable alternatives to this encroachment, and mitigation measures to minimize environmental impacts of encroachments on floodplains. The studies necessary where a proposed highway encroaches on a regulatory floodway or mapped floodplain include hydraulic design, right-of-way, and flood insurance studies. This document is a preliminary LHS, documenting the potential encroachments of all alternatives. Hydraulic design and flood insurance studies will take place during the design process after an alternative has been selected. Where the highway would encroach on an unidentified floodplain, the *Alaska Highway Drainage Manual* states that design standards outlined in 23 CFR 650 A should be followed. This document does not take into account unidentified floodplains that may be impacted by the project, especially the segment west of MP 55 which abuts the Kenai River.

4.2 Kenai Peninsula Borough Floodplain Regulations

The Kenai Peninsula Borough Floodplain Administration has adopted codes and ordinances that regulate construction and improvements in mapped floodplains and regulatory floodways within the Borough. For all encroachments on mapped floodplains, the agency must obtain a floodplain permit from the Borough. Encroachments on regulatory floodways are typically prohibited unless it is shown that the encroachment would not increase base flood elevations (Borough Code, Section 21.06.030).

4.3 Effective and Preliminary Floodplain Mapping

The project area runs approximately from MP 45 to MP 60. There are mapped floodplains on portions of the Kenai River, Russian River, and Cooper Creek within the project area but not throughout the project area. The boxed area shown on Figure 2 illustrates the area in which floodplains have been mapped (FIRM Panels 2125A and 2150A), and this is the study area for the preliminary LHS. These floodplains were mapped by approximate methods and adopted in 1981. This mapping is referred to as FEMA 1981 mapped floodplains within this report. No regulatory floodways have been adopted in the project area.

It is important to note that there are some discrepancies between the FEMA 1981 mapped floodplain and the existing Kenai River channel at Schooner Bend and downstream for approximately three miles. Also, mapped floodplains are updated on occasion, and any segments of alternatives located near the river but currently outside the mapped floodplain may in the future be considered floodplain encroachments. Finally, the project would encroach on the Kenai River floodplain in areas where there is no official "mapped floodplain;" these areas are not addressed in this document, but all culverts, bridges, and longitudinal fill in floodplains are designed to accommodate the base flood and to avoid the rise in water surface elevation during storm events.

The USACE completed a detailed study of a portion of the Kenai River in the Cooper Landing Area in 2010, updated the floodplain boundaries, calculated base flood elevations, and delineated

a floodway. The USACE study area includes only the east half of the FEMA 1981 mapped area and only the Kenai River (see Figure 2). This study has not yet been accepted by FEMA and thus has not been adopted by the Borough, but it likely will be adopted in the near future. This preliminary LHS considers both the effective FEMA 1981 floodplain mapping and the preliminary USACE 2010 floodplain update mapping for the Cooper Landing area.

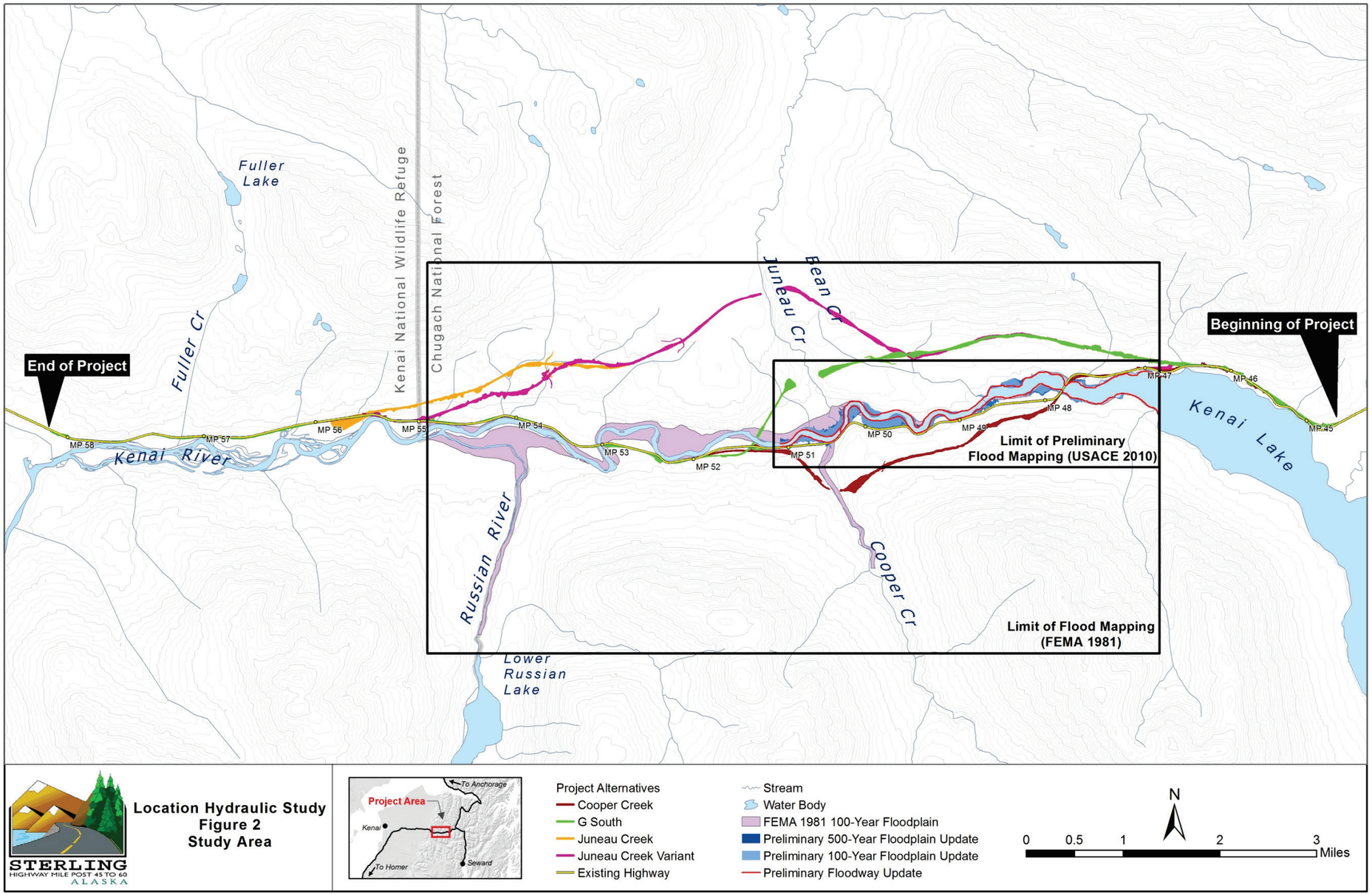

Figure 2. Location Hydraulic Study – study area

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5 Floodplain Encroachment

5.1 Floodplain Encroachment Evaluation Method

Existing NFIP mapping obtained from the FEMA map Service Center and preliminary mapping produced by the USACE and obtained from the Borough's Kenai River Center were used to determine whether a proposed alternative would encroach on a mapped floodplain. Total acres of mapped floodplain encroachments for each alternative are listed in Table 1, as well as preliminary USACE floodplain and floodway encroachments.

Each of the build alternatives would have varied impacts to floodplains within the project area. Both the Cooper Creek Alternative and the G South Alternative propose new bridges to be constructed within the official and preliminary mapped floodplains and floodway. For the Cooper Landing Bridge under the Cooper Creek Alternative, construction would occur within the preliminary floodway. The fill embankment required for these bridges is accounted for in the encroachment calculations; however, the area of impact for bridge piers is not. Preliminary engineering conducted to date does not include that level of detail. The additional area of impact from bridge piers would have a negligible additional effect and would ultimately be accounted for during final design and permitting. The new bridges over Juneau Creek required for the Juneau Creek or Juneau Creek Variant alternative would not affect mapped floodplains.

Where encroachment would occur, the steps necessary to comply with Federal and local regulations are briefly described.

Table 1. Area of Mapped Floodplain Encroachment for Each Build Alternative

Alternative	Approximate Encroachment Area in FEMA 1981 Mapped Floodplains (acres)	Approximate Encroachment Area in Preliminary USACE Floodplains (acres)	Approximate Encroachment Area in Preliminary USACE Floodway (acres)
Cooper Creek	5.1	0.5	0.06
G South	6.2	0	0
Juneau Creek	0	0	0
Juneau Creek Variant	<0.01	0	0

Source: Geographic Information System (GIS) analysis by HDR, 2013.

5.1.1 No Build Alternative

Construction of the existing Sterling Highway in the project area predated current regulatory floodplain maps. Therefore, comparative floodplain encroachment data are not applicable to the No Build Alternative and are not included in this evaluation. Also, the as-built footprint of the existing highway is not available. However, Figure 3 is provided to illustrate the overlap of the existing highway right-of-way (not footprint) with the Kenai River floodplain.

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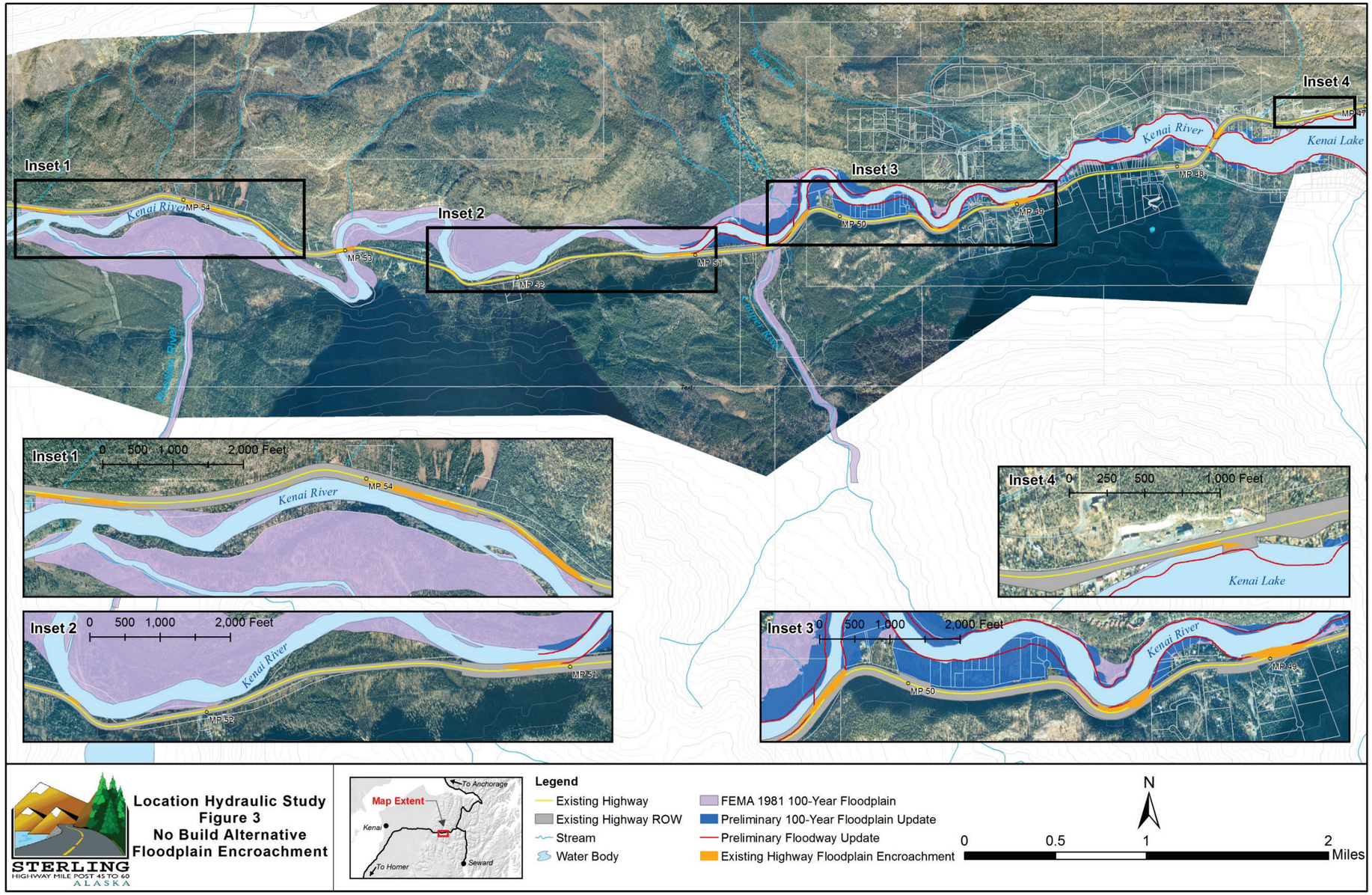

Figure 3. No Build Alternative, floodplain encroachment by the existing right-of-way

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5.1.2 Cooper Creek Alternative

The proposed footprint of the Cooper Creek Alternative intersects FEMA 1981 mapped floodplains of the Kenai River in seven places: two bridge crossings and five longitudinal encroachments where the cut and fill footprint of the alignment intersects the floodplain (Figure 4). Should this alternative be chosen, DOT&PF would need to obtain a floodplain permit and perform hydraulic calculations to show that floodplain encroachments on all affected water bodies would not increase base flood elevations over existing conditions.

The Cooper Creek Alternative would replace the existing Cooper Landing Bridge with a longer bridge immediately adjacent the existing structure. The new Cooper Landing Bridge would involve approximately 0.6 acre of fill within the FEMA 1981 floodplain. Based on the preliminary USACE 2010 floodplain mapping, the area would be approximately 0.5 acre. The bridge approaches would also encroach upon approximately 0.06 acre of the preliminary floodway; however, because its spans would be longer than the existing bridge spans, flood conveyance capacity would be increased over existing conditions, resulting in a net benefit to the floodplain function. Floodway encroachments would be developed pursuant to Borough Code, Chapter 21.06.050, and therefore would not result in any increase in flood levels during the occurrence of a base flood discharge.

South of the Kenai River, the proposed alignment would cross Cooper Creek and its mapped (FEMA 1981) floodplain upstream of the existing Cooper Creek Bridge. The new Cooper Creek Bridge abutments and associated fill would be placed outside of the mapped floodplain, leaving only bridge piers within the floodplain, but outside of the active stream channel.

The crossing of the Kenai River and replacement of Schooner Bend Bridge at MP 53 would be located approximately 80 feet downstream of the existing bridge. The new Schooner Bend Bridge would be slightly longer than the existing bridge. Fill associated with the abutment of the new bridge would encroach on approximately 0.5 acre of the FEMA 1981 floodplain. The old bridge and piers would be removed.

Longitudinal encroachments on floodplains would occur on the floodplain fringe where the alternative's footprint is wider than the existing footprint. Floodplain encroachment would result from placement of fill and riprap, and installation of culverts to accommodate road widening. Five encroachments would occur within the official floodplain (at MPs 47.2, 52, 53.5, 53.9, and 54.7), with a total area of impact of approximately 4 acres.

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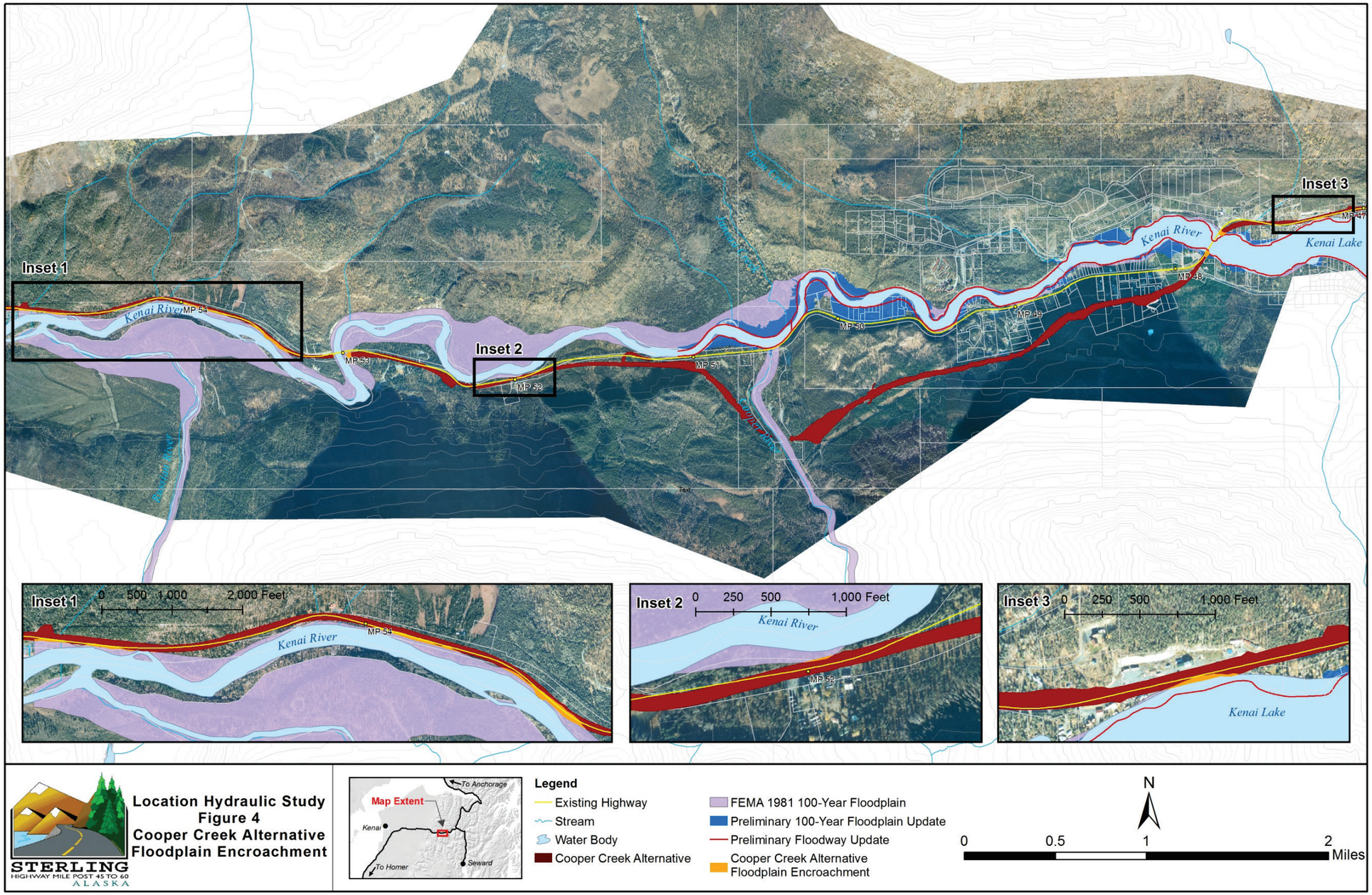

Figure 4. Cooper Creek Alternative floodplain encroachment

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5.1.3 G South Alternative

The proposed footprint of the G South Alternative would encroach on approximately 6.2 acres of the Kenai River effective (FEMA 1981) floodplain in six locations: two new bridges and four longitudinal encroachments where the cut and fill footprint of the upgraded alignment is wider than the current highway (Figure 5). The G South Alternative alignment does not approach the Kenai River in the section the USACE studied in 2010, therefore there would be no change to estimated impacts should FEMA adopt the preliminary mapping.

The 0.5 acre of floodplain impacts from the proposed Schooner Bend Bridge are identical to those described for the Cooper Creek Alternative (see Section 5.1.2). There are four locations of longitudinal encroachments to the Kenai River (at MPs 52, 53.5, 53.9, and 54.7) totaling 3.74 acres of impact to Kenai River floodplain.

The G South Alternative includes a new bridge over Juneau Creek, which does not have a mapped floodplain, and a new bridge over the Kenai River. Fill placed into the floodplain to construct the Kenai River Bridge abutments would affect approximately 1.9 acres of the mapped floodplain.

If this alternative were chosen, DOT&PF would need to obtain a floodplain permit and determine the impact of the proposed bridge and fill on base flood elevations.

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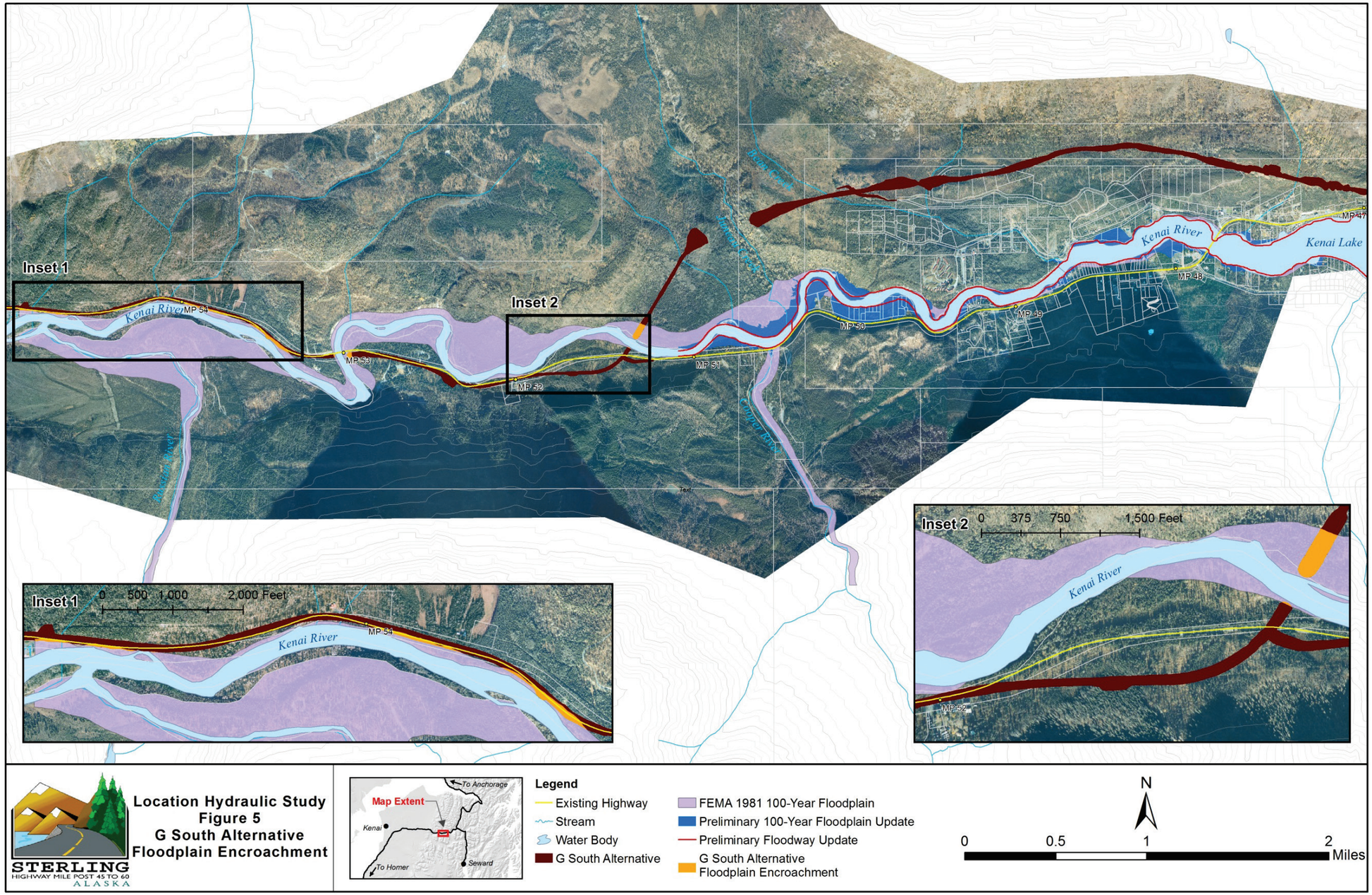

Figure 5. G South Alternative floodplain encroachment

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5.1.4 Juneau Creek Alternative

The proposed footprint of the Juneau Creek Alternative would not encroach on the Kenai River or other mapped floodplains, including both the FEMA 1981 mapped floodplains and or the USACE preliminary floodplain or floodway (Figure 6).

5.1.5 Juneau Creek Variant Alternative

The proposed footprint of the Juneau Creek Variant Alternative includes a <0.01-acre longitudinal encroachment on the effective (FEMA 1981) Kenai River mapped floodplain at approximately MP 54.9 (Figure 6). This alternative would not require bridge crossings of any regulatory floodplains. If the Juneau Creek Variant Alternative were selected as mapped, the DOT&PF would need to obtain a floodplain permit for the fill encroachments. Alternatively, because the impact area is so small, it may be possible to alter the design to avoid any floodplain impacts.

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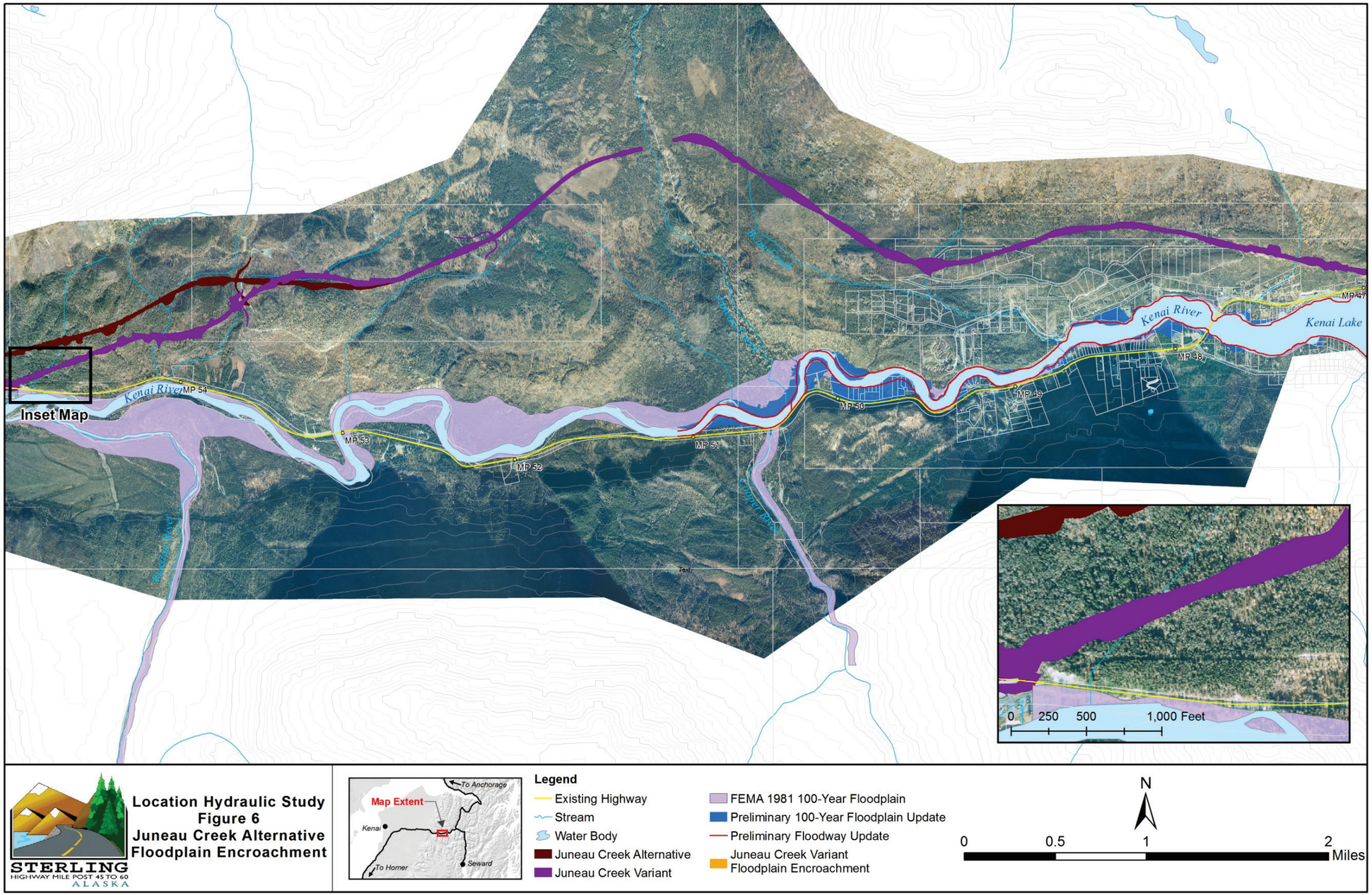

Figure 6. Juneau Creek Alternatives floodplain encroachment

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5.2 Risks Associated with Implementation

In general, risks associated with floodplain encroachment increase with increased encroachment. Where these encroachments do occur, they have the potential to increase flood elevations and velocities during flood events. Structures and portions of the highway that encroach on floodplains are also more likely to sustain damage or fail during overtopping events.

Longitudinal encroachments are minimal for each alternative. The risk of flows overtopping the highway is somewhat less for the Cooper Creek and G South alternatives than for the No Build Alternative, as each of these includes segments that leave the river corridor. Risks associated with encroachment are least for the Juneau Creek alternatives, which do not cross the Kenai River. A detailed analysis of the potential for increased flood hazards and mitigation will be necessary when an alternative has been selected.

5.3 Floodplain Impact Minimization and Mitigation

Measures to minimize negative effects to floodplains, mapped or unmapped, are incorporated in the alternatives. These include locating alignments away from floodplains, increasing bridge lengths at new crossings, and upgrading cross-drainage through culvert placement. Additional measures will be implemented during the design phase when an alternative is selected.

Little or no change to historic drainage patterns is expected within or downstream of the project area. Impacts to the floodplain are minimized by following standard stream crossing design criteria and avoiding direct impacts on stream channels.

5.4 Steps to Completing an LHS if an Alternative with Encroachment is Selected

The *Alaska Highway Drainage Manual* describes the necessary steps if a mapped floodplain or regulatory floodway encroachment, such as that proposed under the Cooper Creek Alternative, is to be accepted. For a regulatory floodway, DOT&PF would first need to show that there is no practicable alternative to placing abutment fill within the floodway, and that the floodway could not be modified to accommodate the fill without causing more than a 1-foot increase in water surface elevations. DOT&PF would then need to work with affected property owners and the community to mitigate any flooding risks associated with encroaching on the floodway, and would need to update flood maps and flood profiles for the area. These studies would be performed at a later stage of design if the Cooper Creek Alternative were chosen and if floodway encroachment could not be avoided. For encroachments to mapped floodplains that do not have a regulatory floodway, DOT&PF would need to determine the impacts of the proposed encroachment on the floodplain, determine any hazards to property, and coordinate with FEMA and the Borough to update flood maps if increased base flood elevations were anticipated.

6 Conclusions

Each alternative, with the exception of the Juneau Creek and No Build alternatives, would encroach on mapped floodplains and thus would require detailed hydraulic analysis, floodplain permits, and coordination with FEMA during the design phase of the project. No significant longitudinal encroachments are proposed in the four build alternatives.

7 References

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——. 1999. *Flood Insurance Study for Kenai Peninsula Borough and Incorporated Areas.*

Federal Highway Administration (FHWA). No date. *Location Hydraulic Studies*. 23 CFR 650, Subpart A.

HDR Alaska, Inc. 2005. *Hydrology and Hydraulics Report Sterling Highway Mile Post 45 to 60 Draft Report*. November 2005.

——. 2005. Record of meeting with Corps representative regarding USACE draft mapping. Record on file with HDR Alaska, Inc.

Kenai Peninsula Borough. 1988. Ordinance No. 88-7 § 2 (part).

Appendix F
Section 4(f) *De Minimis* Findings Forms
DRAFT

Prepared for:

State of Alaska
Department of Transportation and
Public Facilities

Prepared by:
HDR, Inc.
2525 C Street, Suite 305
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March 2015

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Section 4(f) *De Minimis* Impact Finding
for
Parks, Recreation Areas, and Wildlife & Waterfowl Refuges
For FHWA Projects

Project Name: Sterling Highway MP 45–60

Project Number (State and Federal): STP-F-021-2(15)/53014

Property Name: Kenai River Special Management Area (Site 1)
Property Name: See separate form for site 2 (Site 2)

Applicable only if the use of Section 4(f) property, including consideration of avoidance, minimization, mitigation, or enhancement measures, does not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f).

I. Project Description:

The Sterling Highway Milepost (MP) 45–60 Project would reconstruct the Sterling Highway in the project area to reduce congestion, meet current rural principal arterial standards, and improve safety. It would do this by widening lanes, flattening curves, improving site distance, adding shoulders, and ensuring adequate clear zones. The project would add passing lanes and turning lanes as necessary. Depending on the alternative, more or less of the existing alignment would be rebuilt, and a corresponding segment would be built on an entirely new alignment. The build alternatives are the Cooper Creek Alternative, the G South Alternative, the Juneau Creek Alternative, and the Juneau Creek Variant Alternative, as shown on the attached maps. Additional information is available at www.sterlinghighway.net.

This document describes the Cooper Creek Alternative's effects to the Kenai River Special Management Area (KRSMA). The other alternatives either would have no Section 4(f) use of the KRSMA or would have impacts considered greater than *de minimis*.

II. Section 4(f) Property Description(s):
Describe <u>each</u> impacted Section 4(f) property. Description should include size; location; type of property; ownership and identification of official jurisdiction over the Section 4(f) property; and existing and/or documented planned activities, features, and attributes of the property. Include a map depicting the boundaries and major features of the Section 4(f) property.

<u>Kenai River Special Management Area</u>

Section 4(f) property type: Park

Size and Ownership, Including Agreements Related to Ownership

The Alaska Legislature established the KRSMA as a unit of the State park system. It is managed by the Department of Parks and Outdoor Recreation (DPOR). It was established in recognition of the importance of the Kenai River for fish habitat and fishing, both commercial and sport, and to protect it from overuse. Generally, the park is owned by the State. Within the boundaries of the Kenai National Wildlife Refuge (KNWR), KNWR owns the submerged lands, but DPOR and KNWR both assert management authorities over activities on the water and do so cooperatively. The legislative boundaries within the project area encompass the Kenai River itself and Kenai Lake (shown in crosshatch on Map 1 through Map 4; in general, Kenai Lake, the river, and visible beaches without vegetation are part of this park unit, except within the boundaries of KNWR). The special management area includes "the Kenai River… upstream to and including the waters of the Kenai and Skilak Lakes." Overall, the KRSMA protects 105 miles of the river system. DPOR does not report a total acreage; within the project area, the river and Kenai Lake submerged lands under State ownership encompass approximately 720 acres. In total, the KRSMA is estimated at some 44,000 acres.

The Sterling Highway right-of-way in the project area crosses the Kenai River in two locations and extends into the river where the highway parallels the river in several locations. Whether on dry land or submerged lands, any construction activity for transportation within the right-of-way is not considered to be a Section 4(f) use of land. This is because such use would not be a conversion of land use from protected refuge and park property to transportation uses; the land already has been incorporated for transportation uses.

Functions, Available Activities, Existing and Planned Facilities

The KRSMA park unit is an important salmon migration and spawning area and hosts Alaska's most popular salmon sport fishery. Within the project area, KRSMA activities include raft and boat trips on the Kenai River for scenic viewing and sport fishing, as well as fishing along the banks. Discussions with land managers, which included DPOR as well as U.S. Forest Service (USFS) and U.S. Fish and Wildlife Service (USFWS), the Federal agencies that manage the river corridor, did not indicate plans for substantial changes in management direction or addition of facilities.

Access and Use Levels

Access to the Kenai River and Kenai Lake is generally from the Sterling Highway and public boat launch ramps such as Cooper Landing and Sportsman's Landing in the project area (see Map 3 and Map 4). Some rafting and fishing outfitters launch directly from their own property along the river. Use of the Kenai River is high in summer, both for sport fishing and recreational boat trips (e.g., rafting, canoeing, kayaking, and drift boats). Many commercial sport-fishing and boating outfitters operate on the river.

DPOR rangers take occasional counts of river bank use, private boats, and commercial boats. DPOR uses a formula to extrapolate the number of users throughout the month and throughout the year. The counts are not considered to be highly reliable and are thought to undercount actual use. For 2005, DPOR reported bank use at 21,034 persons; users of private boats at 29,964; and users of commercial boats at 3,233. Use continues in the winter in low numbers. In 2012, the USFS counted 67,069 visitors who stayed overnight in the area, used USFS

Campgrounds and Russian River day-use parking, or were counted in the Cooper Landing vicinity. KNWR's estimated number of visitors boating the upper stretch of the river during a typical summer is approximately 25,000.

While there is recreational use of both Kenai Lake and the Kenai River for sport fish and harvest, it is the Kenai River that is more heavily used. Over an 8-year period, from 2004 to 2011, the Alaska Department of Fish and Game (ADF&G) statewide harvest surveys reported that an average of about 120,000 anglers fished the entire Kenai River per year, versus an average of about 500 per year on Kenai Lake. The effort expended averaged 51,000 angler-days per year on the upper Kenai River (project area) in the 2004-2011 period.

The University of Alaska Anchorage Institute for Social and Economic Research (ISER) indicated the importance of the Kenai River in studies related to the balance of commercial and sport fisheries of Kenai River salmon. Using 1993 and 1994 data, ISER indicated that residents of Southcentral Alaska made nearly 626,000 fishing trips throughout Southcentral Alaska. According to ISER, 25 percent of all trips were to the Kenai and Russian rivers, "by far the most popular sport fishing sites in the region." Also, approximately 98,000 nonresidents made sport fishing trips in the region, and 54,000 of these were to the Kenai River system. ISER further reported, "Altogether, residents and visitors spent $136 million in 1993 for sport fishing trips in Southcentral Alaska, with $34 million of that for trips to the Kenai and Russian rivers."

As an indication of harvest, annual species harvests surveys (1997-2006) indicate that anglers keep about 16,000 Chinook (king) salmon; 225,000 sockeye (red) salmon; 43,000 coho (silver) salmon; 10,000 pink salmon; 3,000 rainbow trout; and 6,000 Dolly Varden. Although the numbers of Kenai River king salmon caught are far less, Kenai River kings have an international reputation for their trophy size—up to 100 pounds.

Although fishing is "by far the primary recreation activity," the Kenai River serves many other user groups, including recreational canoers and rafters as well as people viewing scenery and wildlife, picnicking, and camping. Of the 24,941 visitors who used the upper Kenai River between Kenai and Skilak lakes in 2004, 38 percent were not anglers. These various recreational opportunities, in addition to prime fishing, provide the market for guided trips and tours. On average, 388 guides are permitted annually to use the river, making it more accessible to those less experienced with the area while providing stimulus to the local economy.

Relationship to Similarly Used Lands in the Vicinity

There are many other lands in the project area that are managed for developed and dispersed recreation as part of Chugach National Forest and KNWR. Beyond the immediate project area, the KRSMA downstream also is heavily used for sport fishing. Many other rivers, streams, and vast coastal areas also are used for sport fishing, and marine areas are important for commercial and sport fishing. Salmon that spawn in or transit through the project area are important to sport fisheries upstream and downstream and to commercial fisheries in Cook Inlet.

Other Factors

The formally designated park unit in much of the project area is submerged land—land below ordinary high water of Kenai River and Kenai Lake. Exposed gravel bars and beaches generally are included, but forested uplands are not part of the park unit. Where the Kenai River flows through the KNWR, the United States of America owns the submerged lands, but both the Federal and State governments manage the water column. Day-to-day management of the corridor is cooperative between USFWS and DPOR, and generally there is no conflict. Both KRSMA and KNWR are Section 4(f) properties, so the distinction between KRSMA and KNWR within the refuge boundaries does not change whether the river is protected under Section 4(f), but the 4(f) "property" associated with the river within the refuge is KNWR property not KRSMA property.

Activities, Features, and Attributes

The important activities, features, and attributes of the KRSMA in the project area are as follows.

Activities: These include boating/rafting; sport and subsistence fishing from boats, from the bank, and in the Kenai River; viewing and photography; walking the banks; ferrying across the Kenai River to the Russian River; and interpretation, education, and guiding.

Features: These include mostly natural/mixed natural and developed landscape (dominated by water, forest, mountains with occasional views of the highway, two bridges, a ferry, boat launch ramps, and power lines); unique green-colored water; class I and II "whitewater" (relatively mild); salmon, other fish, and their habitat; other wildlife (brown bear, moose, bald eagles, and other birds) and partial habitat for wildlife; commercial and private boat traffic; and the Russian River Ferry.

Attributes: These include world class fishing; a reputation for clean air, clean water, and high-quality river-and-mountain scenery; mostly natural sounds; and easily accessible outdoor recreation.

III. Project Use of the Section 4(f) Property(s):

Identify the impacts the project will have on the activities, features, and attributes of the Section 4(f) property that qualify the property for protection under Section 4(f).

FHWA proposes a *de minimis* impact finding for the Cooper Creek Alternative's use of the KRSMA. The Juneau Creek and Juneau Creek Variant alternatives would not have a Section 4(f) use of the KRSMA, and the G South Alternative impacts are considered greater than *de minimis*. The following discussion addresses the Cooper Creek Alternative.

The Cooper Creek Alternative would be separated from the existing alignment for approximately 3.5 miles (out of about 15 miles total). The area in which the alternative would require use of the KRSMA property is along the current Sterling Highway alignment, where two existing bridges over the Kenai River would be replaced on slightly different alignments, requiring acquisition of new right-of-way from the KRSMA.

The Cooper Landing and Schooner Bend bridges over the Kenai River would be replaced with wider bridges on slightly different alignments than the existing bridges (see Map 2). The acreage of impact totals 0.8 acre over three locations, as shown on Map 2. The Cooper Landing Bridge would be replaced substantially within the existing highway right-of-way. The Schooner Bend Bridge would be replaced partly outside the existing right-of-way but adjacent to the existing location (0.6 acre of use of the KRSMA is at this one site). Another small amount of fill would extend to the river's edge and require a small addition of right-of-way acquired from the KRSMA. The existing bridges would be entirely removed, including piers in the river, except for components of the existing Cooper Landing Bridge that may be used in the new bridge. Use of the KRSMA for bridge abutments and piers would be different than the current bridges, and fewer piers likely would be used than the existing bridges. Mitigation measures discussed in the next section are intended to enhance the appearance of the bridges as seen from the river.

Two noise modeling locations literally in the Kenai River, one near the Russian River confluence and one near the Juneau Creek confluence, each indicated a 1 A-weighted decibel (dBA) increase by 2043 from existing 2012 noise levels, identical to predicted noise levels for the No Build Alternative. This change in average noise level is not expected to be perceptible. However, the river parallels the existing highway and proposed highway alignment closely. Under the Cooper Creek Alternative, highway traffic would be readily audible in some locations, as it is today.

Besides noise, proximity to the river would mean visual effects would continue at levels similar to today, and proximity of all traffic to the KRSMA would retain risks that any spill on the highway could pollute the river.

Forty-three percent of the alignment would remain within 300 feet of Tier 1 streams (mostly the Kenai River). The Cooper Creek Alternative would include a cut (55 feet high and 350 feet long) uphill of the new highway, just east of the Russian River Campground entrance near MP 52.4 (see the top of Map 2 for milepost locations). This would include a widened area of proposed highway right-of-way on the south side of the highway. Although this cut would be located well outside the KRSMA (across the highway from the river), it likely would be easily visible to boaters from some points on the Kenai River over an area of up to 1 mile. The highway in this area would be located up to about 80 feet farther from the river and at slightly higher elevation than the existing highway alignment.

During construction of the bridges, in-water work would be necessary to establish new piers and remove old piers. The construction process likely would require a temporary construction bridge built on multiple pilings at close spacing as a construction platform for the new bridge. A pile driver would drive the many pilings under the temporary bridge (these would be removed before completion of construction), and would drive the larger pilings under the permanent bridge. Temporary reduction of water quality would result from the driving and removal of pilings as bottom sediments are dislodged. Mitigation measures would minimize the risk of fuel spills and dropping of any material into the Kenai River, but spills, leaks, and minor loss of construction material into the river are possible and could temporarily reduce water quality. In addition, construction would result in intermittent loud noise from construction equipment, particularly during pile driving. Construction would also result in temporary closure of the river at the bridge location to boats and fishing when cranes are lifting bridge girders into place and during pile driving near the center of the river. Pile driving near the edges of the river likely would allow sufficient space so that boats could safely pass; when pile driving is taking place on one side of the river, the opposite side of the river would remain open (see next section for mitigation measures related to bridge construction and river navigation).

In the MP 56–58 area, boaters and sport fishers on the Kenai River likely may be more aware of the highway presence following construction than they are today. All build alternatives include retaining walls or rip-rap erosion protection at several locations along the river west of Sportsman's Landing (approximately MP 55; see Map 2). The existing highway is near the river at these same locations, but additional rip-rap or walls could add an engineered look to those viewing the river banks. It is likely that some of these rip-rap or retaining wall areas would be built within the edge of the river and, therefore, within the KRSMA park unit. However, all construction in this area would be within the existing highway right-of-way where it overlaps the river and would not be considered a use of Section 4(f) property. Construction at these locations is not expected to involve diverting water except perhaps at the very edge of the river or on sloughs. No impact to boating, and no substantial impact to bank fishing opportunities, is expected. The permanent impacts to those portions of the KRSMA outside the existing right-of-way would be substantially similar to impacts today, including views of cars and the highway embankment from some locations and the sounds of vehicles on the highway. Temporary impacts would include construction noise and, in a few locations, construction equipment working on the edge of the river.

The overall effect to the KRSMA from the finished road and replacement bridges would be similar to the existing highway, and no substantial impacts to the functions of the KRSMA—including fish habitat and fish movement, river boating, fishing, and viewing—is expected. Because of mitigation, including timing of construction related to fish movement and timing of river closures related to recreational boating, the KRSMA habitat and recreation functions would continue during construction.

The Cooper Creek Alternative would not adversely affect the character of the river and fishing experiences (the activities), features such as boat ramps, or attributes such as a largely natural experience with occasional presence of a highway and vehicles. Exceptions would be temporary during construction of bridges, when there would be a need to restrict boating and fishing in the construction zone. Construction timing would mitigate this impact. The replacement of existing bridges on slightly different alignments under the Cooper Creek Alternative would not affect the features or attributes of the KRSMA.

IV. Impact Avoidance, Minimization, and Mitigation or Enhancement Measures to the Section 4(f) Property(s):

Identify any avoidance (such as avoidance of a feature), minimization, and mitigation or enhancement measures that are included in the project to address the Section 4(f) use.

Cooper Creek Alternative—Measures to Minimize Harm

The Cooper Creek Alternative would result in little permanent harm to the KRSMA. The primary impacts would be during the construction phase. To mitigate these impacts, multiple measures are proposed, as follows.

The two replacement bridges over the Kenai River would be designed with aesthetics, as seen from the river and its banks, in mind. They also would be designed to minimize permanent impact to river hydraulics, fish passage, and navigability. In part, this would be accomplished by minimizing the number of in-water piers. Construction could take place year round. Pile driving, however, would be limited to daytime hours at the Cooper Landing Bridge to avoid disrupting residents at night. River-closing activities, such as moving girders into place, would be the minimum necessary and would take place outside peak river use periods to the greatest extent possible. These activities would be coordinated with KRSMA managers and area land management agencies. Notice of intent to close the river would be given to permitted river guides and area land managers well ahead of actual closure; would be published in Anchorage and Kenai Peninsula newspapers; and would be posted on message signs in the project area and at area campgrounds, boat ramps, and public buildings as appropriate. All parts of any replaced bridge, and any temporary construction or detour bridge, would be removed from the river if not used in a new bridge at the same site.

In support of a U.S. Coast Guard (USCG) Section 9 permit, a navigation plan would be written and followed, incorporating such measures as:

- Closing only one side of the Kenai River at a time, using a buoy line with information posted on the buoys and at boat launch ramps whenever partial closure instead of full closure is possible
- Limiting complete closures of river navigation to fall-winter-spring (approximately August 15 to June 15), whenever possible, and during nighttime hours in summer
- Ensuring a motorized emergency response boat, with qualified operators, would be available at any bridge site at all times during active construction to inform river users of emergency closures and assist boaters to shore, if necessary

The Kenai River navigation plan and anticipated closure schedule would be developed a year in advance of implementation to give notice to commercial river guides for planning the following season. The public would be given an opportunity to comment on the navigation plan. The pilings for the spans of temporary construction bridges would be placed to allow for continued navigation of the river, and sufficient vertical clearance would be provided on the temporary and permanent bridges for ease of navigation. Navigation clearances for the permanent bridges would be the same as or greater than clearance for the existing bridges.

In addition, standard best practices and permit stipulations would be followed to prevent stream bank erosion, siltation or pollution of water, and disruption of river recreation. These would include measures such as:

- Keeping tracked or wheeled equipment out of the river
- Stabilizing exposed earthwork during construction, protecting vegetation to the extent possible, and revegetating exposed or damaged areas following construction
- Ensuring that any imported rock material for placement in and along the river was clean

- Fueling and servicing equipment only at distances of more than 100 feet from wetlands and waters, except for low-mobility equipment such as pile drivers, and specifying detailed fueling and fuel spill contingency plans
- Retaining adequate spill containment and cleanup equipment and supplies on the site
- Avoiding use of preservatives or chemicals in bridge construction that could pollute the river

V. Coordination with the Public:
The information supporting FHWA's intent to make a de minimis impact finding will be included in the National Environmental Policy Act (NEPA) document, and the public will be afforded the opportunity to comment during the NEPA review process. For those actions that may not require public review and comment, a public notice for opportunity to review and comment will be needed. Public involvement efforts must state FHWA's intent to make a de minimis impact finding and provide information necessary to solicit comments.

Public Notice Date: _____ Name of Newspaper: _____

Summarize issues raised and responses to comments (attach all comments received and a copy of the Public Notice).

VI. Coordination with Official(s) with Jurisdiction over the Section 4(f) Property:
Describe the coordination that was done prior to and after coordination with the public. A request for written concurrence from the official with jurisdiction must be initiated after the public has been afforded the opportunity to comment.

FHWA and DOT&PF met with DPOR regarding the KRSMA in April 2009, and DPOR agreed that the Cooper Creek Alternative, with mitigation to retain access and use of the river during the heart of the summer boating and fishing season, appeared to have minimal adverse impact to KRSMA. A meeting with multiple agencies in attendance, including DPOR, also occurred in 2013 and confirmed the earlier discussion. Based on the background presented in this document, FHWA and DOT&PF believe the mitigated impacts of the Cooper Creek Alternative likely would result in *de minimis* use of the KRSMA. A final finding regarding *de minimis* impact will be made following further consultation with the DPOR and following an opportunity for comment from the public.

The official(s) with jurisdiction over the Section 4(f) property concurs in writing that the project will not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f) and has been informed of FHWA's intent to make a *de minimis* impact finding based on this documentation. Attach documentation.

YES ☐ NO ☐

VII. Signatures:
A. I recommend that the FHWA find the impacts on the Section 4(f) property to be *de minimis* because this project will not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f).

_____ Date: _____
DOT&PF Regional Environmental Manager

B. I have determined that:

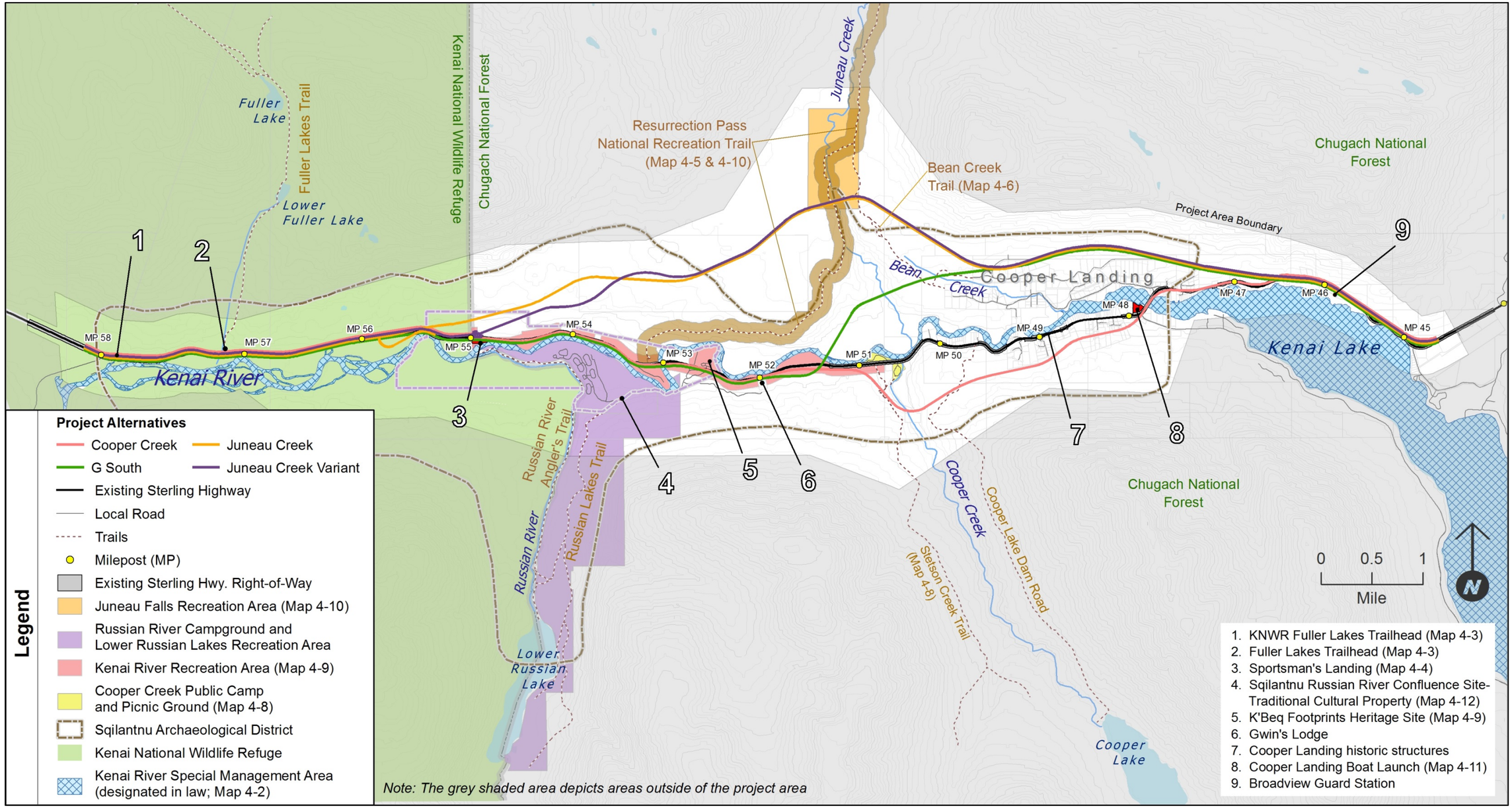
1. The transportation use of the Section 4(f) property, together with any impact, avoidance, minimization, and mitigation or enhancement measures incorporated into the project, does not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f);
2. The public has been informed of FHWA's intent to make a *de minimis* finding and has been afforded an opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the Section 4(f) property;
3. The official(s) with jurisdiction over the property were informed of FHWA's intent to make the *de minimis* impact finding based on written concurrence that the project will not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f); and
4. The project will have a *de minimis* impact on _____ (Property 1).
5. The project will have a *de minimis* impact on _____ (Property 2 if applicable).

_____ Date: _____

FHWA Environmental Program Manager

Attachment(s):

Maps
Copy of Official with Jurisdiction Concurrence (to be provided in final version)
Copy of Public Notice and comments/responses (to be provided in final version)



Map 1. Project vicinity and Section 4(f) properties

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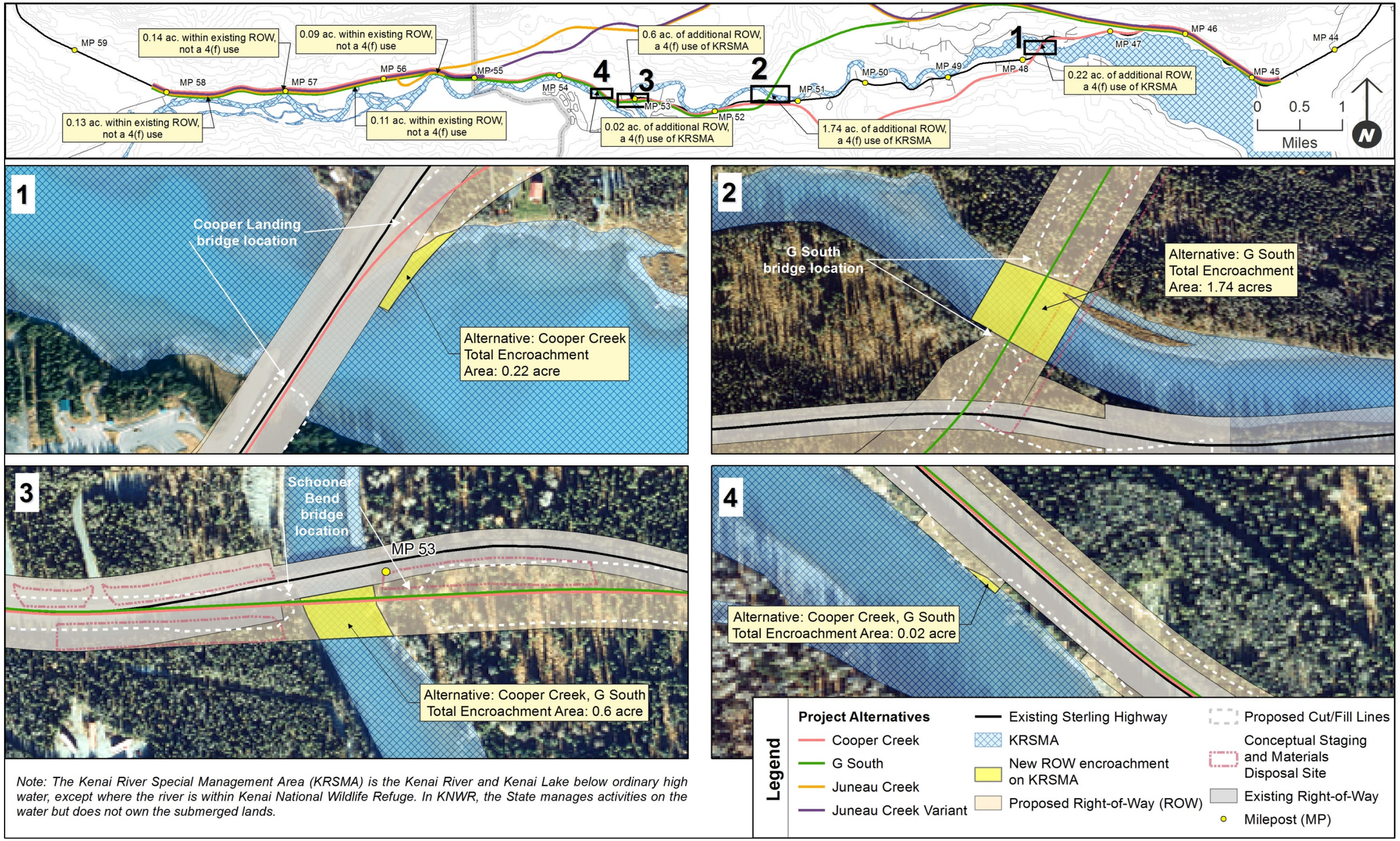

Note: The Kenai River Special Management Area (KRSMA) is the Kenai River and Kenai Lake below ordinary high water, except where the river is within Kenai National Wildlife Refuge. In KNWR, the State manages activities on the water but does not own the submerged lands.

Map 2. Kenai River Special Management Area (KRSMA)

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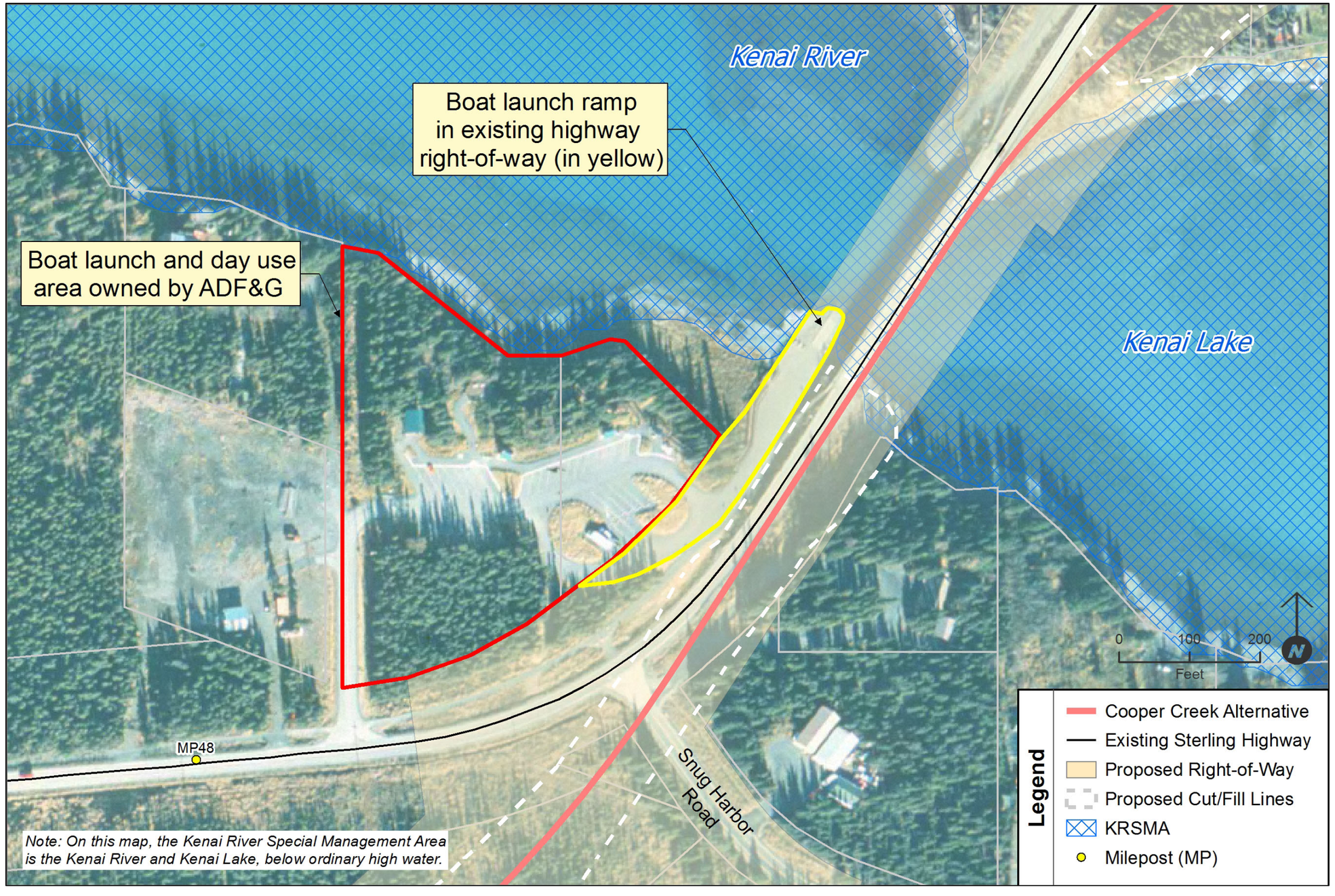

Map 3. Cooper Landing Boat Launch and Day Use Area

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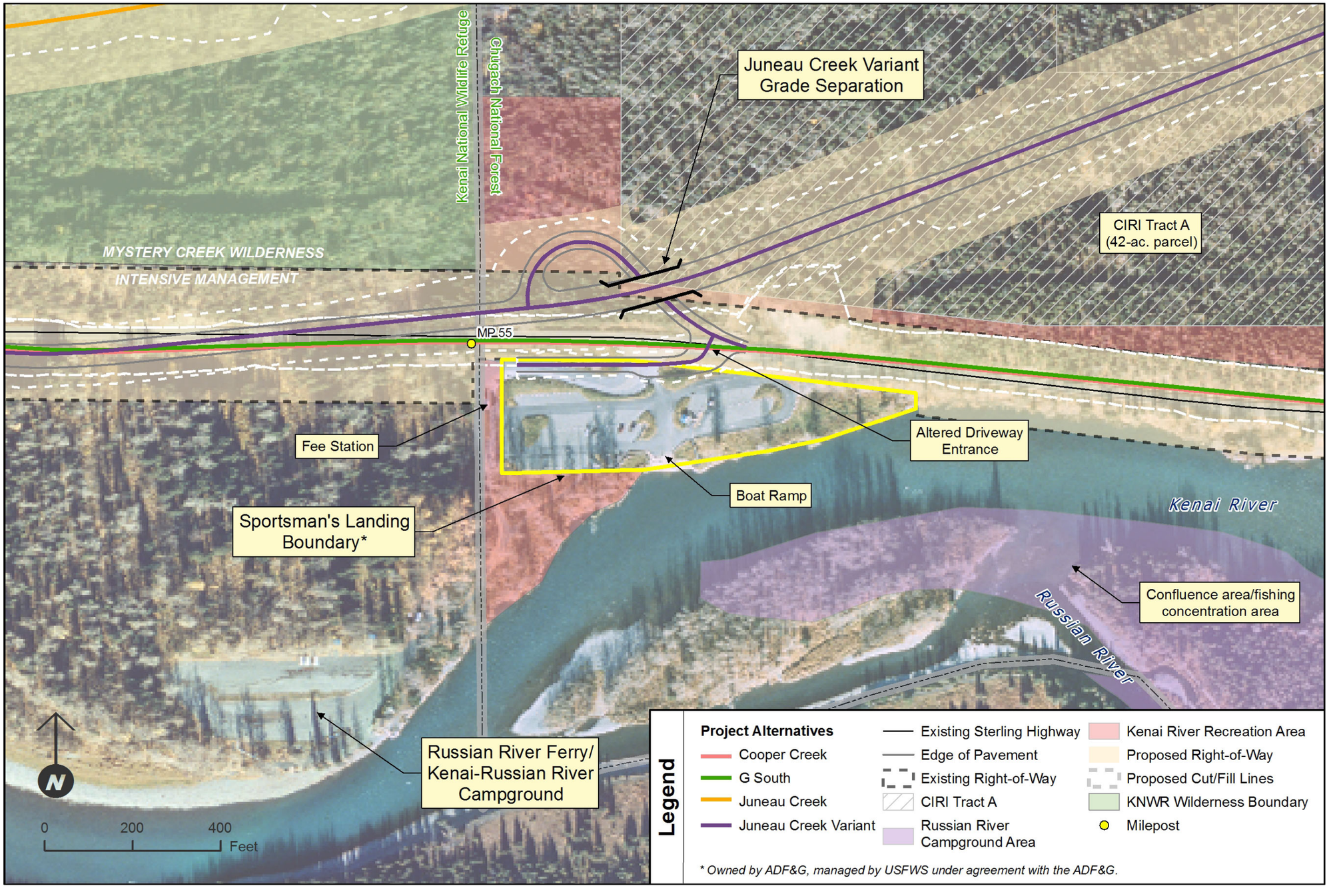

Map 4. Sportsman's Landing

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Section 4(f) *De Minimis* Impact Finding
for
Parks, Recreation Areas, and Wildlife & Waterfowl Refuges
For FHWA Projects

Project Name: Sterling Highway MP 45–60

Project Number (State and Federal): STP-F-021-2(15)/53014

Property Name: See separate form for site 1 (Site 1)
Property Name: USFS Kenai River Recreation Area (Site 2)

Applicable only if the use of Section 4(f) property, including consideration of avoidance, minimization, mitigation, or enhancement measures, does not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f).

I. Project Description:

The Sterling Highway Milepost (MP) 45–60 Project would reconstruct the Sterling Highway in the project area to reduce congestion, meet current rural principal arterial standards, and improve safety. It would do this by widening lanes, flattening curves, improving site distance, adding shoulders, and ensuring adequate clear zones. The project would add passing lanes and turning lanes as necessary. Depending on the alternative, more or less of the existing alignment would be rebuilt, and a corresponding segment would be built on an entirely new alignment. The build alternatives are the Cooper Creek Alternative, the G South Alternative, the Juneau Creek Alternative, and the Juneau Creek Variant Alternative, as shown on the attached maps. Additional information is available at www.sterlinghighway.net.

This document describes the effects of the project on the U.S. Forest Service (USFS) Kenai River Recreation Area. The Cooper Creek, G South, and Juneau Creek Variant alternatives each would use a portion of the recreation area. The Juneau Creek Alternative would not. The Cooper Creek and G South alternatives would follow the existing alignment in the MP 51–55 area, where the recreation area is located. The alternatives would affect the recreation area along the existing alignment, where straightening and widening the highway would require acquisition of new right-of-way from the recreation area. The Juneau Creek Variant Alternative would clip a corner of the recreation area.

II. Section 4(f) Property Description(s):
Describe <u>each</u> impacted Section 4(f) property. Description should include size; location; type of property; ownership and identification of official jurisdiction over the Section 4(f) property; and existing and/or documented planned activities, features, and attributes of the property. Include a map depicting the boundaries and major features of the Section 4(f) property.

<u>USFS Kenai River Recreation Area</u>

Section 4(f) property type: Recreation Area

Size and Ownership, Including Agreements Related to Ownership
The Kenai River Recreation Area is located entirely within the Chugach National Forest (CNF; 350 acres) and is owned by the United States of America. It is shown on Map 1 and Map 2. The area parallels the Kenai River and the existing Sterling Highway from the CNF western boundary east to Cooper Creek Campground (another recreation area). The recreation area was designated with the highway as a reference point. The area is defined as:

- All land between the highway and the Kenai River
- On the side of the highway opposite the river, all lands in a strip between the highway and a line set 400 feet from and parallel to the highway.

See "Other Factors," below.

The USFS considers this area a "special place" recognized by the public. The recreation area generally is the Kenai River and Russian River confluence area. The USFS had also, during earlier coordination, indicated the importance of the Kenai River Recreation Area as a buffer and as a Federal holding that prevented transfer of the land for other purposes, such as State or Native corporation selection and potential private development.

Functions, Available Activities, Existing and Planned Facilities
Much of the recreation area along the highway is not developed. USFS has indicated the main recreation function of the area is to allow the public to access land along the Kenai River. Portions of the recreation area that are developed include the driveway entrance that leads to the Russian River Campground and to the trailhead for the Russian Lakes Trail. Located off the driveway and within the recreation area is a large overflow parking area used principally at the height of fishing season. The parking area also serves as the winter trailhead for the Russian Lakes Trail when the driveway is not plowed. The Resurrection Pass Trail's trailhead and driveway, as well as a small parking area and informal trail near MP 53.7, also are located within the Kenai River Recreation Area.

In addition to these access and parking facilities, the K'Beq Footprints Heritage Site is a developed feature within this recreation area (see Map 1 and Map 2). The K'Beq Footprints Heritage Site encompasses approximately 34 acres and is managed by the Kenaitze Indian Tribe through an agreement with CNF. While it is focused primarily on cultural interpretation, it is also available for recreation that is not related to archaeology or the Tribe. There are picnic tables, people fish from the site, and people pay to park there and walk offsite to hike or fish nearby (particularly when other parking is full). The USFS mandates that the Tribe allow this kind of use, and the Tribe is working to increase use of the site by others, such as boaters stopping for lunch. The Tribe is working toward slow expansion of services and facilities offered at the K'Beq site, including potential new trails and facilities. The K'Beq site replaced an earlier interpretive site called Beginnings, also located within the recreation area. It is now closed as an interpretive site. A small pulloff along the highway still is sometimes used for informal access to the Kenai River.

Cook Inlet Region, Incorporated (CIRI) Tract B (20.5 acres), adjacent to the K'Beq site, was transferred from the CNF in 2012, removing 20 acres of Kenai River Recreation Area land from Federal ownership. However, the USFS retained a public easement along the river through this parcel for recreational access to the river, and this easement retains Section 4(f) protection as part of the recreation area. The K'Beq site is shown on Map 1 and Map 2; the CIRI parcel appears in Map 4-12 in Chapter 4 of the Sterling Highway MP 45–60 Project Supplemental Environmental Impact Statement (SEIS).

Access and Use Levels

Access to the recreation area is directly from the Sterling Highway and from the Kenai River (for boaters). Short driveways lead from the highway to the K'Beq site and Resurrection Pass trailhead, and a longer driveway leads to the Russian River Campground. Use of the Kenai River Recreation Area is dispersed and visitors are not formally counted.

Relationship to Similarly Used Lands in the Vicinity

This recreation area abuts the Russian River Campground and Cooper Creek Public Camp and Picnic Ground (see Map 1), both designated for recreation purposes. It also abuts the Sportsman's Landing Boat Launch and the Kenai National Wildlife Refuge (KNWR); see Map 1 and Map 3. The K'Beq site, in addition to providing interpretation of area archaeology, offers some recreation amenities similar to those offered at nearby campgrounds and the KNWR visitor contact station (e.g., short trails, information, public toilets, public parking, and river access).

Other Factors

The public land order that created the recreation area defines the boundaries in terms of distance from the highway but does not define "the highway," so it is not clear whether the 400-foot measurement is meant to be taken from the centerline of the highway, the edge of the constructed highway, or the edge of the highway right-of-way. Title research indicated that the recreation area was established "subject to valid existing rights," and the highway right-of-way predated the 1991 establishing public land order. The State of Alaska believes the edge of the right-of-way is the appropriate point of reference. The maps for the Sterling Highway MP 45–60 Project SEIS portray the recreation withdrawal based on this interpretation and have been presented to USFS officials with jurisdiction. The public land order indicates the recreation withdrawal area is 350 acres. Since that time, two large parcels have been transferred to CIRI, and recreation area boundaries also encompass other private parcels. Calculations for this project using geographic information systems result in a total of 282 acres. It appears the acreage was originally estimated based on inclusion of all lands adjacent to the highway, including the parcels in private hands today. Even then, the total does not reach 350 acres.

Activities, Features, and Attributes

The important activities, features, and attributes of the USFS Kenai River Recreation Area are as follows.

Activities*:* These include sport and subsistence fishing from the Kenai River bank, viewing and photography, cultural interpretation/touring cultural sites, and guiding (e.g., float trip participants coming to shore for lunch, etc.), and parking for trailheads and fishing.

Features*:* These include mixed natural forest and developed roadside landscape, a driveway to Russian River Ferry, a trailhead for Resurrection Pass Trail and winter trailhead/overflow parking for Russian Lakes Trail/Russian River Campground, and the K'Beq Heritage Site interpretive area/parking/cabin. Non-recreational features include archaeological historic properties and a permit for the Heritage Site.

Attributes: These include access to the Kenai River, access to world class sport fishing, primarily natural views, easily accessible outdoor recreation, recreation access and associated highway sounds and activity, and historic and cultural importance of the area for Dena'ina people and mining history.

III. Project Use of the Section 4(f) Property(s):
Identify the impacts the project will have on the activities, features, and attributes of the Section 4(f) property that qualify the property for protection under Section 4(f).

The Federal Highway Administration (FHWA) proposes to make a *de minimis* impact finding for the Cooper Creek, G South, and Juneau Creek Variant alternatives' uses of the Kenai River Recreation Area, depending on which alternative is selected for construction. The Juneau Creek Alternative would not use land from the Kenai River Recreation Area. The paragraphs below provide an overview of use for the Kenai River Recreation Area, followed by descriptions specific to each alternative.

The Cooper Creek and G South alternatives would affect the Kenai River Recreation Area by expansion of the existing right-of-way beyond its current limits periodically throughout much of the length of the Kenai River Recreation Area. The Juneau Creek Variant Alternative would provide a new roadway and associated 300-foot-wide right-of-way through a small corner of the recreation area at its far western end, near Sportsman's Landing (Map 3). With most traffic on a new alignment through this corner of the recreation area, the Juneau Creek Variant Alternative would substantially reduce traffic on the "old" highway through the length of the recreation area so that most traffic was local and/or focused on recreation.

The USFS indicated the Kenai River Recreation Area is significant as a "special place" associated with the Kenai River. It does not function in the same way as most recreation areas. It was formed around the highway, with the highway specifically running through the center of this linear area. It is mostly undeveloped for recreation, and the developments that do exist appear mostly incidental (e.g., overflow parking associated with the Russian River Campground, which is located within another recreation area; the trailhead for the Resurrection Pass Trail; and the K'Beq Footprints Heritage Site, which is used for cultural and archaeological interpretation).

All of the developed features and their associated activities would be avoided by the proposed alignments, and none would be adversely impacted by any alternative. With turn pockets and wider shoulders proposed under the G South and Cooper Creek alternatives, access to and from these developments would be enhanced. The Juneau Creek Variant Alternative would enhance access to and from these developments by reducing traffic on the "old" highway. There are also Sqilantnu Archaeological District features within the recreation area other than the interpretive site features.

The recreation area totals 282 acres. The expanded right-of-way for the G South Alternative would use 31.9 acres (11 percent of the total). The Cooper Creek Alternative would use 41.3 acres (15 percent), and the Juneau Creek Variant Alternative would use 1.2 acres (0.4 percent). These uses would include the forest/habitat (a feature of the recreation area), but not any developed recreation feature. Much of the new right-of-way would remain forested. However, during final design every effort would be made to reduce the highway footprint and need for additional right-of-way, and a small portion of existing right-of-way would be returned to the USFS. None of the build alternatives would affect the developed recreation features, and the USFS has indicated relatively little concern with the encroachments into this recreation area.

Further detail on use of the property follows, by alternative.

Cooper Creek Alernative

The existing highway right-of-way would be widened in some locations adjacent to the Kenai River Recreation Area to accommodate the wider, straighter alignment of the Cooper Creek Alternative (see Map 2). The area of impact in the Kenai River Recreation Area under the Cooper Creek Alternative would be 41.3 acres. The recreation area was formed around the highway as a sort of buffer, providing for a natural corridor along the Kenai River and between the highway and the river. Although the Cooper Creek Alternative has a greater acreage

of impact to the recreation area than the G South Alternative, the effect on the functions of the recreation area are similar. None of the developed sites within the recreation area that have a recreation function (i.e., the K'Beq Footprints Heritage Site, the Resurrection Pass trailhead, and the entrance and overflow parking area for the Russian River campground) would be permanently affected. Trees and vegetation would be cleared to establish the required clear zone for the wider highway, and clearing would permanently reduce wildlife habitat in a narrow strip along the highway.

Average hourly traffic noise in the recreation area would be similar to noise levels today. Three locations within the recreation area were modeled for noise impacts at various distances from the highway. Two showed increases of 1 A-weighted decibel (dBA) in average sound levels (not considered perceptible), and one showed an increase of 6 dBA in average sound levels (distinctly noticeable) by 2043. At the site closest to the highway, the location of the parking area and trailhead for the old Beginnings Heritage Site within the recreation area (now closed), the change in average sound level would rise from 67 dBA to 68 dBA. While this would be only a 1 dBA change from existing, the absolute level would exceed the FHWA noise abatement criteria of 66 dBA, as does the modeled sound level today. The No Build Alternative was modeled at the same level. This site is not used much but can be an access point to reach the Kenai River on foot. Otherwise, it is indicative of near-highway noise levels at the boundary of the recreation area and the highway right-of-way.

During construction, noise, dust, and the visual clutter of construction equipment and disturbed soil would be temporary impacts to those passing through the recreation area on the highway. Construction noise likely would carry to the trailheads, parking areas, and heritage site developments. Construction activity would be visually screened from all these sites by trees. Temporary traffic delays, closures, and detours would occur (see Section 4.6 of the SEIS for mitigation). The contractor would be required to maintain access to these sites during construction, except the Beginnings Heritage Site, which is now closed as a public interpretive site and is used only as an ancillary, informal river access point.

G South Alternative

The existing highway right-of-way would be widened in some locations adjacent to the Kenai River Recreation Area (Map 2) to accommodate the wider, straighter alignment of the G South Alternative. The recreation area was formed around the highway as a sort of buffer, providing for a natural corridor along the Kenai River and between the highway and the river. Although the G South Alternative has a lower acreage of impact than the Cooper Creek Alternative, the effect on the functions of the recreation area are similar. The area of impact in the Kenai River Recreation Area under the G South Alternative would be 31.9 acres. None of the developed sites within the recreation area that have a recreation function (i.e., the K'Beq Footprints Heritage Site, the Resurrection Pass Trail trailhead, and the entrance and overflow parking area for the Russian River campground) would be affected. Trees and vegetation would be cleared to establish the required clear zone for the wider highway, and clearing would permanently reduce wildlife habitat in a narrow strip along the highway.

Average hourly traffic noise in the recreation area would be similar to noise levels today. Three locations within the recreation area were modeled for noise impacts at various distances from the highway. Two showed increases of 1 dBA in average sound levels in 2043 (not likely perceptible), and one showed an increase of 6 dBA in average sound levels (distinctly noticeable) in 2043. At the site closest to the highway, at the location of the parking and trailhead for the old Beginnings Heritage Site interpretive trail within the recreation area, the change in average sound levels would be from 67 dBA to 68 dBA. While this would be only a 1-dBA change from existing, the absolute level would exceed FHWA noise abatement criteria (66 dBA), as does the modeled sound level today. The No Build Alternative was modeled at the same 68 dBA level. This site is not much used but is an access site for the recreation area. Otherwise, it is indicative of near-highway noise levels at the boundary of the recreation area and the highway right-of-way.

During construction, noise, dust, and the visual clutter of construction equipment and disturbed soil would temporarily impact those passing through the recreation area on the highway. Construction noise likely would carry to the trailheads, parking areas, and heritage site developments. Construction activity would be visually screened from all these sites by trees. Temporary traffic delays, closures, and detours would occur (see Section 4.6 of the SEIS for mitigation). The construction contractor would be required to maintain access to these sites during construction, except the Beginnings Heritage Site, which is now closed as public interpretive site and is used only as an ancillary, informal river access point.

Juneau Creek Variant Alternative

The Juneau Creek Variant Alternative's western junction with the existing Sterling Highway right-of-way would occur just east of the KNWR/CNF boundary at MP 55 (Map 1 and Map 2 provide an overview; Map 3 shows detail). At the junction, the Juneau Creek Variant Alternative would cross about 300 feet of the Kenai River Recreation Area, and a highway overpass would be placed in this location. The existing Sterling Highway would be routed under the overpass to connect with the new alignment. This would be necessary to accommodate the Sportsman's Landing/Russian River Ferry entrance, separating the entrance from the main highway. The total area of use of Kenai River Recreation Area under the Juneau Creek Variant Alternative would be 1.2 acres. None of the developed features of the recreation area would be affected. The area used would be north of the existing highway, where the ground is principally steep and forested. No substantial dispersed recreation use of this area is known to occur. With minimal recreation use, the primary impact would be loss of wildlife habitat and natural forest foreground views as seen from the Kenai River and the existing highway. These impacts would not occur under the Juneau Creek Alternative.

IV. Impact Avoidance, Minimization, and Mitigation or Enhancement Measures to the Section 4(f) Property(s):

Identify any avoidance (such as avoidance of a feature), minimization, and mitigation or enhancement measures that are included in the project to address the Section 4(f) use. For each of the following alternatives, features of the property (as described above) would be affected in minor ways. Impacts would be avoided and minimized to the extent possible.

Cooper Creek Alternative—Measures to Minimize Harm

Natural forest would be cleared only where necessary to widen the road and provide a safe clear zone. Much of the right-of-way would retain forest. The appearance of the resulting landscape would remain a mix of natural forest and developed roadside.

Driveways for trailheads, recreation sites, and the interpretive site all would be improved at their connection to the highway (e.g. with turn lanes) but otherwise the driveways and the developed trailheads, parking lots, and interpretive sites would be avoided.

Many historic properties (archaeological sites) within the recreation area have been avoided and, during final design, efforts would be taken to avoid additional sites wherever possible. Where archaeological sites would be impacted, measures to minimize harm would be implemented. These are the subject of an agreement among consulting parties, including Tribes and government agencies, that is in development. Anticipated measures include data recovery at select sites, public interpretation, and assistance with a Sqilantnu Archaeological District management plan, subject to the terms of the final agreement.

A traffic management plan would be prepared to ensure reasonable access to recreation sites within the Kenai River Recreation Area. The management plan would be presented to the USFS, U.S. Fish and Wildlife Service (USFWS), Alaska Department of Fish and Game (ADF&G), Alaska Department of Natural Resources Division of Parks and Outdoor Recreation (DNR/DPOR), Alaska State Troopers, and CIRI ahead of implementation for discussion of access issues.

Small portions of the right-of-way for the existing highway would be remainders not needed for the new highway alignment. These would be returned to the national forest and to the recreation area. Under the Cooper Creek Alternative, the portions of existing right-of-way returned to the USFS would total 3.8 acres.

G South Alternative—Measures to Minimize Harm

Natural forest would be cleared only where necessary to widen the road and provide a safe clear zone. Much of the right-of-way would retain forest. The appearance of the resulting landscape would remain a mix of natural forest and developed roadside.

Driveways for trailheads, recreation sites, and the interpretive site all would be improved at their connection to the highway (e.g. with turn lanes) but otherwise the driveways and the developed trailheads, parking lots, and interpretive sites would be avoided.

Many historic properties (archaeological sites) within the recreation area have been avoided and, during final design, efforts would be taken to avoid additional sites wherever possible. Where archaeological sites would be impacted, measures to minimize harm would be implemented. These are the subject of an agreement among consulting parties, including Tribes and government agencies, that is in development. Anticipated measures include data recovery at select sites, public interpretation, and assistance with a Sqilantnu Archaeological District management plan, subject to the terms of the final agreement.

A traffic management plan would be prepared to ensure reasonable access to recreation sites within the Kenai River Recreation Area. The management plan would be presented to the USFS, USFWS, ADF&G, DNR/DPOR, Alaska State Troopers, and CIRI ahead of implementation for discussion of access issues.

Small portions of the right-of-way for the existing highway would be remainders not specifically needed for the new highway alignment. These would be returned to the national forest and to the recreation area but would have very little practical importance to the function and appearance of the recreation area. Under the G South Alternative, the portions of existing right-of-way returned to the USFS would total 5 acres.

Juneau Creek Variant Alternative—Measures to Minimize Harm

Natural forest would be cleared only where necessary to widen the road and provide a safe clear zone. Much of the right-of-way would retain forest. The appearance of the resulting landscape would remain a mix of natural forest and developed roadside.

The driveway for Sportsman’s Landing and the Russian River Ferry would be improved (e.g. with turn lanes) but otherwise the developed parking lots would be avoided.

Many historic properties (archaeological sites) within the recreation area have been avoided and, during final design, efforts would be taken to avoid additional sites wherever possible. Where archaeological sites would be impacted, measures to minimize harm would be implemented. These are the subject of an agreement among consulting parties, including Tribes and government agencies, that is in development. Anticipated measures include data recovery at select sites, public interpretation, and assistance with a Sqilantnu Archaeological District management plan, subject to the terms of the final agreement.

The roadway embankment and highway underpass in this location, which would be prominent in the view from the existing Sterling Highway through the recreation area, would be designed to minimize visual impact, particularly through landscaping and revegetation, including tree plantings as well as seeding with native seed mix. The overpass bridge would be designed with aesthetics in mind.

V. Coordination with the Public:
The information supporting FHWA's intent to make a de minimis impact finding will be included in the National Environmental Policy Act (NEPA) document, and the public will be afforded the opportunity to comment during the NEPA review process. For those actions that may not require public review and comment, a public notice for opportunity to review and comment will be needed. Public involvement efforts must state FHWA's intent to make a de minimis impact finding and provide information necessary to solicit comments.

Public Notice Date: _____ Name of Newspaper: _____

Summarize issues raised and responses to comments (attach all comments received and a copy of the Public Notice).

VI. Coordination with Official(s) with Jurisdiction over the Section 4(f) Property:
Describe the coordination that was done prior to and after coordination with the public. A request for written concurrence from the official with jurisdiction must be initiated after the public has been afforded the opportunity to comment.

FHWA met with USFS in April 2009 and September 2010 and indicated to USFS that the percentages of use were high enough for the Cooper Creek and G South alternatives that FHWA questioned whether to propose findings of *de minimis* use. The USFS, however, indicated that none of the alternatives appeared to adversely affect the primary activity—access to the Kenai River—and they believed all of the impacts to be *de minimis*.

The official(s) with jurisdiction over the Section 4(f) property concurs in writing that the project will not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f) and has been informed of FHWA's intent to make a *de minimis* impact finding based on this documentation. Attach documentation.

YES ☐ NO ☐

VII. Signatures:
A. I recommend that the FHWA find the impacts on the Section 4(f) property to be *de minimis* because this project will not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f).

_____ Date: _____
DOT&PF Regional Environmental Manager

B. I have determined that:

1. The transportation use of the Section 4(f) property, together with any impact, avoidance, minimization, and mitigation or enhancement measures incorporated into the project, does not adversely affect the activities, features, and attributes that qualify the property for protection under Section 4(f);
2. The public has been informed of FHWA's intent to make a *de minimis* finding and has been afforded an opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the Section 4(f) property;
3. The official(s) with jurisdiction over the property were informed of FHWA's intent to make the *de minimis* impact finding based on written concurrence that the project will not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f); and
4. The project will have a *de minimis* impact on _____ (Property 1).
5. The project will have a *de minimis* impact on _____ (Property 2 if applicable).

_____ Date: _____

FHWA Environmental Program Manager

Attachment(s):

Maps
Copy of Official with Jurisdiction Concurrence (to be provided in final version)
Copy of Public Notice and comments/responses (to be provided in final version)

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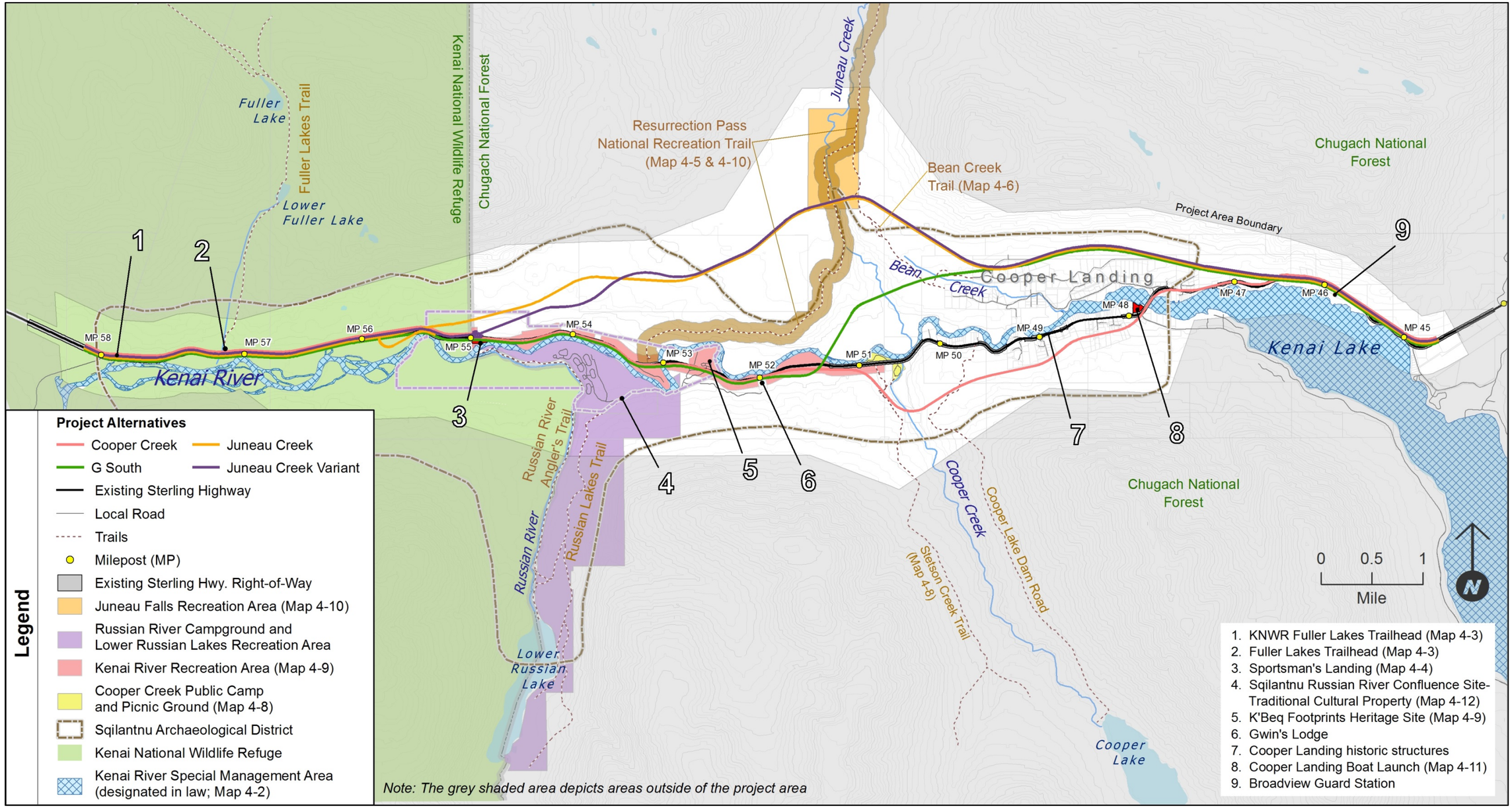

Map 1. Project vicinity and Section 4(f) properties

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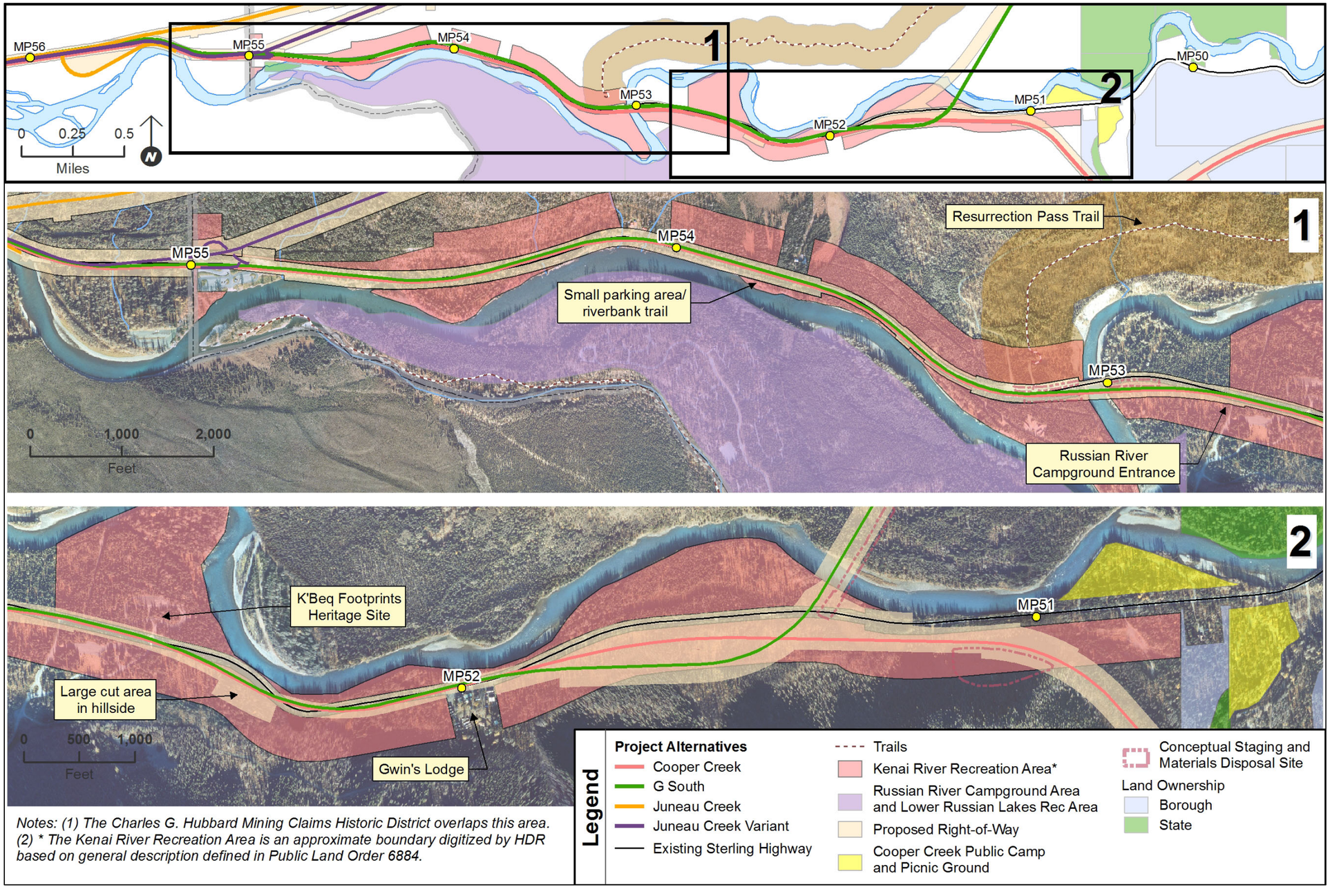

Notes: (1) The Charles G. Hubbard Mining Claims Historic District overlaps this area.
*(2) * The Kenai River Recreation Area is an approximate boundary digitized by HDR based on general description defined in Public Land Order 6884.*

Map 2. USFS Kenai River Recreation Area

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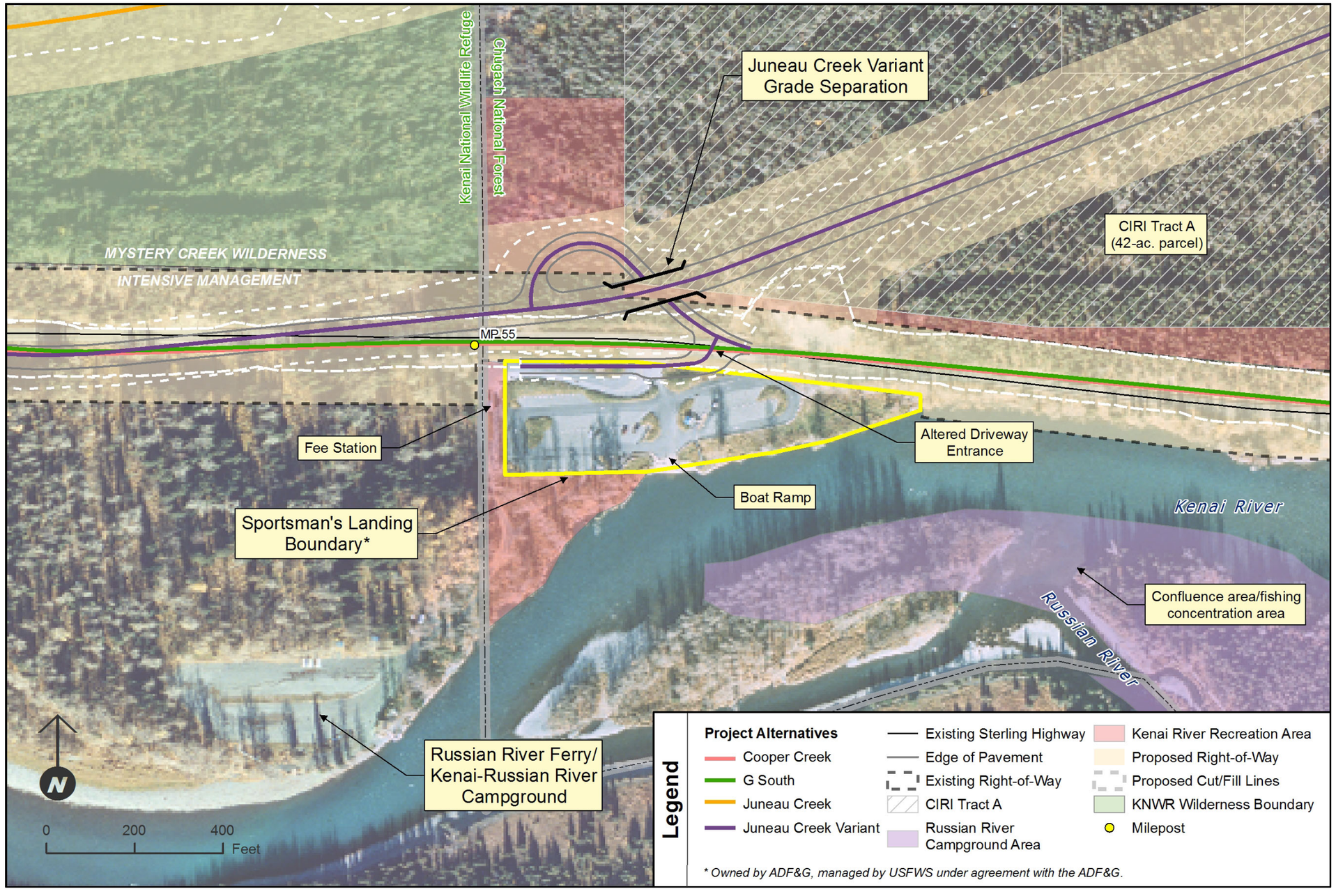

Map 3. Sportsman's Landing

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